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College of Extended Learning, MCS 3WEC
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P O Box 30001
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Office of Veteran Educational Benefits,
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New Mexico State University
P O Box 30001
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Mail service for box patrons is provided by a branch post office located on campus. Telephone service is through the Las Cruces telephone exchange, (575) 646-0111.

NEW MEXICO STATE UNIVERSITY

Graduate Catalog 2011-2012

Academic programs at
New Mexico State University are
available to all students without
regard to age, ancestry, color,
disability, gender, national origin,
race, religion, sexual orientation,
or veteran status.

Any item in this catalog
is subject to modification at any time
by proper administrative procedure.

The NMSU Undergraduate Catalog is available online at www.nmsu.edu.

Catalog Editor: *Jacobo Varela*
Student Assistant: *Kori Keyes*

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GENERAL INFORMATION

THE UNIVERSITY

New Mexico State University is a thriving center of higher education deeply rooted in the multicultural tradition of the Southwest. Situated at the gateway to Mexico, the university's 6,250-acre campus is among the largest in the world.

Founded in 1888 as Las Cruces College, the university was established the next year as a land-grant college by an act of the Legislative Assembly of the Territory of New Mexico in accordance with provisions of the Morrill Act. As New Mexico College of Agriculture and Mechanic Arts, the institution grew steadily over the next 71 years, fulfilling its purpose as a nonsectarian center of learning in the broadest possible service to the state and nation.

The growth and maturity of the institution was formally recognized in 1960 when the constitution of New Mexico was amended to change the name to New Mexico State University. Today, the university's students can major in 77 areas of undergraduate study in six undergraduate colleges. The Graduate School offers 50 areas of study on the master's level, 3 areas on the specialist in education level, and 24 on the doctoral level. The university offers degrees through the doctorate, is accredited by The Higher Learning Commission and is a member of the North Central Association of Colleges

and Schools (NCA). In addition, many departments and colleges are further accredited by organizations serving their special fields.

New Mexico State University is the state's land-grant university, serving the educational needs of New Mexico's diverse population through comprehensive programs in education, agriculture, engineering, and public service.

In its growth and expansion, the university has achieved distinction in many special fields. It has on its campus one of the three full-time planetary observatories in the nation, as well as one of the largest computer centers in the Southwest. NMSU has over \$163 million in total sponsored program expenditures. According to the National Science Foundation, NMSU ranks third among all Hispanic Serving Institutions and first among those without a medical school on the basis of FY 2008 research expenditures.

The university's central campus is located at the southernmost interchange of the Pan American Highway, Interstate 25, in southern New Mexico. Also bordering the campus is Interstate 10, the principal east-west route across the southern United States. The university is adjacent to Las Cruces, New Mexico.

ACCREDITATION

New Mexico State University has been accredited since 1926. We are accredited by The Higher Learning Commission and are a member of the North Central Association of Colleges and Schools. The Higher Learning Commission may be contacted at Higher Learning Commission, 30 North LaSalle St., Suite 2400, Chicago, IL 60602-2504 and (800) 621-7440 or www.ncahigherlearningcommission.org. The university was accredited in 1954 by the American Association of University Women. Our accredited programs are:

College of Agricultural, Consumer and Environmental Sciences

The Department of Animal and Range Sciences is accredited by the Society for Range Management.

College of Arts and Sciences

The Department of Chemistry and Biochemistry is accredited by the American Chemical Society.

The Master of Public Administration program in the Department of Government is accredited by the National Association of Schools of Public Affairs and Administration.

Music curricula in the Department of Music are accredited by the National Association of Schools of Music.

College of Business

The baccalaureate and graduate degree programs in business and accounting are accredited by AACSB International--The Association to Advance Collegiate Schools of Business.

College of Education

The College of Education is accredited by the New Mexico Public Education Department.

The Communication Disorders Program within the Department of Special Education/Communication Disorders is accredited by the American Speech-Language-andHearing Association.

The Counseling Psychology Doctorate Program within the Department of Counseling and Educational Psychology is accredited by the American Psychological Association (APA). The Master of Arts in Counseling and Guidance is accredited by the Council of Accreditation of Counseling and Related Educational programs (CACREP).

The university's teacher preparation program was accredited in 1962 by the National Council for the Accreditation of Teacher Education. This program involves several colleges and is directed by the College of Education.

College of Engineering

The Accreditation Board for Engineering and Technology (111 Market Place, Suite 1050, Baltimore, MD 21202-4012 or by phone (410) 347-7700) has

accredited baccalaureate degree curricula in chemical, civil, electrical, geological, industrial, mechanical and surveying engineering, and for the bachelor and associate degree programs in civil, electronic, and mechanical engineering technology.

College of Health and Social Services

The Master of Public Health (MPH) in Community Health Education, Department of Health Science, is accredited by the Council on Education for Public Health.

The Department of Nursing Graduate Program is accredited by the Commission on Collegiate Nursing Education.

The School of Social Work, is accredited by the Council on Social Work Education.



THE GRADUATE SCHOOL

A number of academic departments of the university have a long history of providing formal graduate study. The first master's degree was awarded in 1896. In 1921, an organization was established to supervise graduate study when the president appointed a committee to supervise the work. The Graduate School, formally established in 1956 with a full-time dean, is one of the fastest-growing divisions of the university. In 1956, 57 master's degrees were awarded. In 2009-2010, the following were awarded: 7 specialist in education degrees, 798 master's degrees; 65 doctoral degrees, and 18 graduate certificates. The Graduate School currently enrolls 3,753 students pursuing advanced degrees.

Fellowships, assistantships, and special loan programs are available in growing numbers and value for students who have achieved good academic records in their undergraduate and/or graduate programs. With the rapidly expanding facilities, laboratories, and library holdings, the Graduate School of New Mexico State University offers unique programs of high quality graduate study. There are 732 regular faculty.

The Graduate School mission is to facilitate the exchange of ideas and the creation of knowledge, while fostering academic excellence. The Graduate School promotes a high quality-learning environment that embraces diversity. New Mexico State University is one of the few research extensive universities that reflect Hispanic, Native American, other American cultures and the world. Our international students from Latin American, Asian, African, and European countries add to the richness of our diversity. The quality of life for our students is of critical importance to the Graduate School and NMSU. We cultivate the marriage of academic, professional, and personal skills while helping students graduate in a timely manner.

The Graduate School and Graduate Student Services strive to provide quality services to students, faculty and staff.

GRADUATE DEGREE PROGRAMS, SPECIALIZATIONS/CONCENTRATIONS, AND APPROVED MINORS

Because graduate degrees are awarded for attainment in scholarship, the requirements stated in this catalog are to be considered as minimal. The major department or the dean of the Graduate School may make additional requirements deemed necessary for each candidate. Each student's program is subject to the approval of the department head concerned. Responsibility for securing approval of the proposed program of study rests with the student.

Frequent consultation with the adviser is essential to satisfactory planning and progress toward a degree.

Graduate degrees, concentrations, approved minors, and the programs in which they are awarded are listed below. Please note that these are official specializations/concentrations for each degree program. They supersede those listed in the department listings of the Graduate Catalog.:

Interdisciplinary Master of Art

Interdisciplinary Master of Science

Master of Accountancy

Master of Agriculture

Specialization/Concentration in:

Agribusiness

Domestic Animal Biology

Master of Applied Geography

Master of Arts

Agricultural and Extension Education

Anthropology

Art

Communication Disorders

Communication Studies

Counseling and Guidance

Specialization/Concentration in:

Counseling

Guidance and Human Relations

Economics

Specialization/Concentration in:

Public Utility Policy and Regulation

Education

Specialization/Concentration in:

Autism Spectrum Disorders

Bilingual Education

Bilingual/Multicultural Special Education

Bilingual Speech-Language Pathology

Early Childhood Education

Early Childhood Special Education

Educational Diagnostics

Educational Learning Technologies

Language, Literacy & Culture

Special Education

Special Education Administration

Special Education/Deaf-Hard of Hearing

Speech-Language Pathology

Teaching English to Speakers of Other Languages

Educational Administration

English

Government

History

Specialization/Concentration in:

Public History

Psychology

Sociology

Spanish

Master of Arts in Teaching

Specialization/Concentration in:

Math

Science

Spanish

Master of Business Administration

Specialization/Concentration in:

Agribusiness

Finance

Information Systems

Master of Criminal Justice

Master of Fine Arts

Master of Fine Arts in Creative Writing

Master of Music

Master of Public Administration

Master of Public Health

Master of Science

Aerospace Engineering

Agricultural Biology

Agricultural Economics

Animal Science

Applied Statistics

Astronomy

Bioinformatics & Computational Biology

Biology

Chemistry
Computer Science
Family and Consumer Sciences
Geology
Horticulture
Mathematics
Molecular Biology
Physics
Plant and Environmental Science
Range Science
Wildlife Science

Master of Science in Chemical Engineering

Master of Science in Civil Engineering

Master of Science in Electrical Engineering

Master of Science in Environmental Engineering

Master of Science in Industrial Engineering

Master of Science in Mechanical Engineering

Master of Science in Nursing

Specialization/Concentration in:
Nursing Administration

Master of Social Work

Professional Master of Financial Mathematics

Specialist in Education

Curriculum and Instruction
Specialization/Concentration in:
Educational Diagnostics
Special Education Administration
Special Education/Deaf-Hard of Hearing
Special Education
Education Administration
Reading
School Psychology

Doctor of Economic Development

Doctor of Nursing Practice

Adult Health Nursing
Advanced Practice in Psychiatric-Mental Health Nursing
Public/Community Health Nursing

Doctor of Education

Curriculum and Instruction
Educational Administration
Special Education
Specialization/Concentration in:
Bilingual/Multicultural Special Education

Doctor of Philosophy

Aerospace Engineering
Animal Science
Astronomy
Biology
Business Administration
Specialization/Concentration in:
Management
Marketing
Chemistry
Computer Science
Counseling Psychology
Curriculum and Instruction
Educational Administration
Engineering
Specialization/Concentration in:
Chemical Engineering
Civil Engineering

Electrical Engineering
Industrial Engineering
Mechanical Engineering

Interdisciplinary Doctorate
Mathematics
Molecular Biology
Nursing
Physics
Plant and Environmental Science
Psychology
Range Science
Rhetoric and Professional Communication
Special Education
Specialization/Concentration in:
Bilingual/Multicultural Special Education

DUAL AND JOINT DEGREES PROGRAMS

Master of Art in History and Master of Public Administration

Master of Criminal Justice and Master of Public Administration

Master of Public Health and Master of Social Work

Bachelor of Science in Engineering and Master of Business Administration
(5 year combined program)

Bachelor of Accountancy and Master of Accountancy
(5 year combined program)

Bachelor of Science and Master of Chemical Engineering
(5 year combined program)

Bachelor of Science and Master of Civil Engineering
(5 year combined program)

Bachelor of Science and Master's of Science in Electrical Engineering
(5 year combined program)

Bachelor of Science and Master's of Science in Industrial Engineering
(5 year combined program)

Bachelor of Science and Master's of Science in Mechanical Engineering
(5 year combined program)

Bachelor of Science and Master's of Science in Physics

GRADUATE CERTIFICATE PROGRAMS

Digital Communications

Digital Signal Processing

Electric Energy Systems

Finance

Online Teaching and Learning Certificate

Public Utility Policy and Regulation

Systems Engineering

Telemetry

APPROVED GRADUATE MINORS AND PROGRAMS

Accounting

Accounting
Information Systems

Agricultural Economics and Agricultural Business

Agricultural Economics

Animal and Range Sciences

Animal Science
Range Science

Anthropology

- Anthropology
- Archaeology
- Forensic Anthropology
- Native American Studies

Applied Statistics

- Applied Statistics

Astronomy

- Astronomy

Agricultural Extension Education

- Agricultural Extension Education
- International Agriculture Development and Extension

Center for Latin American and Border Studies

- Latin American Studies

Chemistry and Biochemistry

- Biochemistry
- Chemistry

Communication Studies

- Communication Studies

Computer Science

- Computer Science

Curriculum and Instruction

- Bilingual Education
- Curriculum and Instruction
- Early Childhood Special Education
- Education
- Educational Learning Technologies
- Reading

Educational Management and Development

- Educational Administration

Electrical Engineering

- Computer Engineering
- Electrical Engineering

Entomology, Plant Pathology, and Weed Science

- Agricultural Biology

Family and Consumer Sciences

- Family and Consumer Sciences

Finance

- Finance

Geography

- Geographic Information Science and Technology (GIS&T)

Government

- Government
- Public Administration
- Security and Intelligence Studies

History

- History

Health Science

- Alcohol and Drug Counseling (interdisciplinary)
- Environmental and Occupational Health
- Gerontology
- Public Health
- US/Mexico Border Health Issues

Hotel, Restaurant and Tourism Management

- Hotel, Restaurant, and Tourism Management

Human Performance, Dance and Recreation

- Adapted Physical Education

- Dance

Languages and Linguistics

- Spanish

Management

- Management

Mathematics

- Mathematics

Mechanical Engineering

- Mechanical Engineering

Molecular Biology

- Bioinformatics (with Computer Science)

Physics

- Physics

Plant and Environmental Science

- Agronomy
- Horticulture

Psychology

- Psychology

Social Work

- Alcohol and Drug Counseling (interdisciplinary)

Special Education and Communication Disorders

- Communication Disorders
- Deaf Education
- Special Education

Sociology

- Sociology

Women Studies

- Women Studies

ADMISSION

Students seeking admission to graduate student status at New Mexico State University must hold a minimum of a bachelor's degree or an advanced degree from a regionally accredited institution. The program of preparation should be substantially equivalent in the distribution of academic subject matter to the requirements for a comparable degree at New Mexico State University. Candidates for advanced degrees are required to demonstrate proficiency in written and spoken English.

The minimum grade-point averages required to be considered for admission to a master's program are explained under "Categories of Graduate Students." To be considered for admission to a doctoral program, an applicant must have a grade-point average of 3.0. Some programs also require a master's degree or its equivalent. For admission purposes only, graduate courses older than seven years will not be considered.

No student will be officially admitted into a graduate program at NMSU until a "Certificate for Admission" has been issued by Graduate Student Services. Although Graduate Student Services considers this certificate valid for a period of one year, departments may require re-application if the student does not enroll in the semester noted in the certificate.

DOMESTIC STUDENT APPLICATION FOR ADMISSION

Formal application is required of all prospective domestic students, including graduates of New Mexico State University, who seek admission to a graduate program. The application is available at the Graduate Student Services home page at <http://prospective.nmsu.edu/graduate>.

Applicants should submit the application form, the nonrefundable \$30 application fee, and official transcripts in sealed envelopes to Graduate Student Services. Transcripts must be mailed directly from the previous institution to NMSU.

Applicants should also contact the department to which they are applying to request any additional application materials required by the department.

INTERNATIONAL STUDENT APPLICATION FOR ADMISSION

International students must apply through International Student Services by completing the "International Application for Admissions" form and paying the nonrefundable application fee of \$50. You can request an application or information from International Admissions at the following address: International Admissions, MSC 3G, New Mexico State University, P. O. Box 30001, Las Cruces, NM 88003-8001, U.S.A. The phone number is (575) 646-2017, and the fax number is (575) 646-7721. The e-mail address is ias@nmsu.edu. The web site address is provided below: <http://prospective.nmsu.edu/international/>

International students that wish to engage in graduate studies at New Mexico State University must be proficient in the English language. To be considered for admission to NMSU, all international students must submit an official score of 550 or above on the paper-based or 79 on the internet-based Test of English as a Foreign Language (TOEFL). The TOEFL is administered by the Educational Testing Service. To learn more about TOEFL, please visit their web site at: <http://www.ets.org>.

New Mexico State University also accepts test scores from the International English Language Testing System (IELTS). Please note that IELTS is jointly managed by the British Council, IDP: IELTS Australia, and the University of Cambridge ESOL Examinations. A test score of 6.5 or above on IELTS is needed for admissions consideration by Graduate Student Services. The IELTS scores can be used as an alternative to the TOEFL. To learn more about IELTS, please visit their web site: <http://www.ielts.org/>.

Only scores from exams taken within the previous two years and reported directly from the testing service programs to New Mexico State University will be accepted. NMSU's code for TOEFL score reporting is 4531.

The TOEFL requirements or the IELTS requirement may be waived for students who hold a degree from an accredited university in the United States, or from a country or accredited university where English is the official language of instruction. In addition, international students that have successfully completed two years of education in an accredited institution of higher learning in the United States do not have to take the TOEFL or IELTS exams. Exchange students that have studied at New Mexico State University for at least one year and maintained a satisfactory grade point average are also exempt from taking the TOEFL or IELTS exams for admissions into graduate programs at NMSU.

The TOEFL requirement or the IELTS requirement may also be waived for international students who demonstrate English proficiency by satisfactorily completing an approved English as a Second Language program within two years of applying for admissions to graduate school at NMSU. NMSU is a university partner with ELS Language Centers. An ELS course 112 which is completed and passed at an ELS Language Center meets the English proficiency requirement. Other English as a Second Language Programs must be approved by Graduate Student Services of New Mexico State University.

NMSU will accept international students on a conditional basis that have TOEFL or IELTS scores that fall below the accepted levels. International students can be accepted on a conditional basis that have met admissions requirements of Graduate Student Services and the department, and that have an official score of 500 to 549 on the paper-based or 61 to 78 on the internet-based Test of English as a Foreign Language (TOEFL). A test score between 5.0 and 6.0 on IELTS is needed for conditional admissions consideration by Graduate Student Services. Conditionally admitted international students will need to take the Academic English Proficiency Test offered by the Department of Communication Studies. Based on the recommendation of the Department of Communication Studies, Graduate Student Services may require the student to successfully complete one or more English as a foreign language course(s). If completion of one or more courses is required, the student should enroll in the first such course during his or her first semester at NMSU, or prior to taking an assignment as a teaching assistant. Faculty members can appeal decisions concerning language training needs of students.

Students who do not meet the minimum TOEFL requirement for conditional admission (below 71-78 Internet-based, or 530 paper-based) or IELTS score below 6.0 will be admitted tentatively to NMSU. A tentative admission to NMSU requires that students enroll in intensive English classes through the Center for Intensive Training in English (CITE). Depending on a student's TOEFL score and the CITE Placement Test administered upon arrival, the student will be placed in the Beginning (SPCD 101/401), Intermediate (SPCD 102/402), or Advanced level (SPCD 103/403) of the CITE program. Students will register for 6, 9 or 12

credits for each level based on his or her English language needs. The number of credits is determined by the Director of CITE along with the student's advisor. Students admitted tentatively to CITE should be aware that the duration of their studies at NMSU may be one, two, or three semesters longer in order to satisfy their intensive English requirements. Once completing all necessary levels of the CITE program successfully, students are considered to have achieved the minimum TOEFL-equivalent English proficiency (61 internet-based/500 paper-based) required by NMSU. All students who complete the CITE program will then take the Department Proficiency Test to determine if they will need to take any further non-intensive English courses. For further information about the Center for Intensive Training in English, go to the CITE website at <http://web.nmsu.edu/~nmsucomm/CITE.htm>.

Conditional students cannot work as teaching assistants. However, they can work as research assistants. Conditional students can become regular students once they have successfully completed the required English courses and successfully meet regular admissions requirements. Tentative admits with CITE requirement cannot work as teaching or research assistants.

International Transcript Evaluation

Starting with Fall 2010, all students providing foreign transcripts as part of the admissions process are required to have the transcripts evaluated by a transcript credentialing service. Please contact Graduate Student Services for a list of approved credentialing agencies.

DISTANCE EDUCATION APPLICANTS

Complete information on Distance Education programs at New Mexico State University is available at (575) 646-4692; (800) 821-1574 in New Mexico, or from the office of Distance Education, MSC 3CEL, New Mexico State University, P. O. Box 30001, Las Cruces, NM 88003-8001, or via e-mail at distance@nmsu.edu. Visit the Web pages at <http://extended.nmsu.edu/> and <http://distance.nmsu.edu/>.

Domestic students wishing to enter a graduate degree program must apply for graduate admission through Graduate Student Services of NMSU. For more information see the section "Domestic Student Application for Admission" in this catalog.

International students that wish to enroll in our distance education courses and degree programs must be proficient in the English language whether they are part time or full time students. All international distance education applicants must take the Test of English as a Foreign Language (TOEFL) or the International English Language Testing system (IELTS). For more information, please see the section on International Admissions. International students apply through the office of Graduate Student Services. For more information see the section "International Student Application for Admission" in this catalog.

The College of Extended Learning provides comprehensive distance learning opportunities to meet diverse educational and professional needs anytime, anywhere. As New Mexico's land-grant institution, NMSU has a university-wide mission to expand the capacity of extension, outreach, and distance education to communities across the state. The Distance Education program is designed to serve students who find it difficult or impossible to take classes during the week or on the main campus. The Distance Education program offers regular full-credit courses that may include face-to-face interaction and/or course delivery through synchronous or asynchronous written, electronic, or other media forms. The distance education program also provides quality educational programs at off-campus sites through a variety of different delivery methods.

ADMISSION TO A GRADUATE CERTIFICATE PROGRAM

A graduate certificate is a program of study that is designed to develop or enhance a focused area of expertise. The primary purpose of graduate certificate programs is to provide specific skill training to enhance employability to quickly meet employment needs locally, regionally, nationally, and globally.

A graduate certificate is a focused collection of courses, consisting of 12-18 credits, which are successfully completed by students in a given discipline or a set of related disciplines. A graduate certificate is not an official graduate degree of New Mexico State University. Students that successfully complete a certificate program at the graduate level will receive a certificate of completion statement on their official transcript and a formal certificate from NMSU Graduate Student Services. A student has 3 years to complete a graduate certificate program.

Graduate certificate programs can be offered to currently enrolled degree seeking students and students that meet the admissions criteria but that enroll

solely to obtain a certificate in a given area of expertise. International students must also meet the international student admissions requirements. Completing courses as part of a certificate program does not guarantee admissions into a graduate degree program. The department makes the final decision on admissions into a degree program. Certificate only seeking graduate students who are not currently enrolled in a master's, educational specialist program or doctoral degree program will be admitted into a separate classification called "Graduate Certificate Student."

Concentrations or specializations within a graduate program or major differ from graduate certificate programs in that they are designed to meet the needs of enrolled degree seeking students of New Mexico State University. Enrolled degree seeking students must apply separately for the certificate program prior to completing half of their required degree credits.

Students enrolled in certificate programs cannot transfer credits from another institution towards the completion of the certificate program offered by New Mexico State University. However, they can transfer credits taken in a graduate certificate program of NMSU into a graduate degree program of New Mexico State University provided that the courses will lead towards a graduate degree in the focused area of the certificate program. The number of transfer credits will be determined by the program of study. The time limit on course transfer is 5 years after the completion of the certificate.

APPLICATION DATES AND DEADLINES

To be considered for internal fellowships and graduate assistantships of NMSU, Graduate Student Services encourages students to apply by March 15th for fall enrollment and by October 15th for spring enrollment. Otherwise, please apply at least 30 days prior to the first day of classes.

Many of our departments/programs have application deadlines and some may admit students only once a year. Please call or check the departmental web sites to obtain information on application deadlines.

Applications received by Graduate Student Services closer to the deadlines will be processed as time allows. Applicants may be unable to meet their plans to be approved for graduate student status and register for classes if their applications are not received in a timely manner.

Students are encouraged to apply as early as possible so they can be considered for financial support. For information on awards, see <http://gradschool.nmsu.edu/gradschool/announcements.html>; for information on grants, fellowships, and assistantships see <http://gradschool.nmsu.edu/fellowships/index.htm>.

TRANSCRIPTS

Applicants must arrange with each institution previously attended to have one official transcript of all their undergraduate and graduate work sent directly to the Graduate Student Services.

If undergraduate work has not been completed at time of application, the student must obtain a transcript complete with degree statement as soon as the degree has been granted. No application materials will be returned to the applicant.

STANDARDIZED TESTS

Some departments may require standardized test scores for admission. Graduate students may be required to take one or more of the following examinations, as determined by the major department: Graduate Record Examination, the Miller Analogies Test, the Graduate Management Admission Test. Some departments also require the Graduate Record Examination Subject Test. (See departmental description for which tests are required.)

The Graduate Record Examination is required, prior to evaluation of credentials for admission, of all students from universities with a nontraditional grading system. Information booklets and applications for all tests may be obtained from the Office of Student Development or from these Web sites: <http://www.ets.org> or <http://www.gre.org>. Out-of-town mailing is available.

READMISSION

Former students of NMSU who have been out of school for more than two consecutive terms are required to make formal application for readmission. Applications should be submitted to Graduate Student Services at least 30 days before the opening of the semester or summer session for which the student plans to enroll.

A student who has attended other institutions during an absence must have official transcripts forwarded directly to Graduate Student Services by the

registrar of each institution and must be eligible to return to the college or university last attended. Transcripts must be received prior to the date of registration. Admission status at the time of readmission will normally be determined by previous NMSU academic standing. However, academic performance at other institutions attended during the applicant's absence from NMSU may be taken into consideration in determining the student's admission status.

RENEWAL OF APPLICATION FOR ADMISSION

The admission credentials of applicants who do not register for the semester to which they had been admitted are normally retained in Graduate Student Services for a period of one calendar year from the date of application. At the end of this period, credentials are discarded. Students wishing to renew their applications after the one-year lapse must submit new applications, pay another application fee, and provide new credentials.

DENIED ADMISSION

Graduate Student Services, or the department in which the applicant wishes to pursue an advanced degree, may deny admission if the scholastic record or program of study is judged inadequate as a foundation for advanced academic or professional study. If denied admission by Graduate Student Services, the applicant may seek "undeclared" status as described in "Categories of Graduate Students." If denied by the department, the student may wish to contact the department for additional information.

Admission may be denied to otherwise qualified students when the desired program lacks resources to accommodate additional enrollment.

Applicants may be denied admission to either Graduate Student Services or the department/program. A student who is denied admission to one program and wishes to be considered for another program must complete a new application for the second program and pay another application fee.

The second application will be forwarded to the second department, along with supporting documents including transcripts and letters submitted with the first application, once the second application fee is paid.

Application documents are retained by Graduate Student Services for only one calendar year.

CATEGORIES OF GRADUATE STUDENTS

Students seeking admission to a graduate program are assigned to one of the following categories based upon their previous academic performance.

Regular Student

A student applying for an advanced degree, whose scholastic record is satisfactory, will be admitted as a regular student. This category includes:

- (a) a beginning domestic graduate student who has either an overall 3.0 grade-point average or a grade-point average of 3.0 in the last half of undergraduate work,
- (b) a beginning international graduate student who has an overall 3.0 grade-point average (or its equivalent), or continues to earn a 3.0 grade point average, and
- (c) a continuing graduate student who maintains at least a 3.0 grade-point average in graduate courses.

Provisional Student

A student applying for an advanced degree whose scholastic record is not entirely satisfactory is admitted as a provisional student. This classification includes:

- (a) a continuing graduate student whose cumulative grade-point average at the close of any term is less than 3.0,
- (b) a beginning graduate student who does not have an overall 3.0 grade-point average or 3.0 in the last half of undergraduate work, but who does have at least a grade-point average of 2.5, and
- (c) a beginning graduate student who has qualified for admission by taking nine graded graduate credits as a undeclared student (defined below).

A student admitted provisionally must complete the first three courses totaling at least eight credits of graduate work, with an average of at least 3.0. A provisional student who does not meet the 3.0 grade-point average is subject to dismissal. Provisional students cannot work as teaching assistants. However, they can work as research assistants.

Undeclared Graduate Student

Students who have not decided on a specific graduate department or program, but who have an undergraduate grade point average of at least 2.5 may be

considered for admission to the Graduate School under this status. It is critical to note that no more than nine hours of graduate credit taken at NMSU under undeclared status may be transferred into a degree program. Furthermore, students admitted as undeclared graduate students are not eligible to receive graduate teaching assistantships or financial aid.

Transfer from undeclared status to a degree program requires an Application for Admission so that the appropriate information can be referred to and evaluated by the designated department. For admissions purposes, if the student has nine or more graded graduate credit hours, the cumulative grade-point average must be at least 3.0 for the request for admissions to be considered. If the student has less than nine graded graduate credits, the recommendation for admission into a degree program will be for provisional status if the undergraduate grade-point average is 2.5 to 2.9. If the undergraduate grade-point average is at least 3.0, the recommendation will be for admission under regular status. Completing courses as an undeclared student does not guarantee admissions into a graduate degree program. The department makes the final decision on admissions into a degree program.

International students with an F-1 visa are not eligible for the undeclared status.

Students who have been denied admission to the Graduate School by the department may enroll as undeclared students in the college of interest and can complete up to nine credits of graduate work (exclusive of directed readings and independent study) with a grade-point average of 3.0 or above. It should be noted that enrollment in some graduate-level courses is restricted to students accepted into specific programs. Undeclared graduate students are not allowed to transfer more than 9 graduate credits of a grade of B or better into a degree program.

Academic advising for undeclared students should be obtained from the department or program of interest to the student.

After meeting GPA requirement, and upon receipt of an "Application for Admission" the student's records will be resubmitted to the department of choice for a decision on admission. Completing courses as an undeclared student does not guarantee admissions into a graduate degree program. The department makes the final decision on admissions into a degree program.

Any student whose graduate application is incomplete may apply as a undergraduate non-degree student in order to register for classes.

Graduate Study by University Seniors (Senior Petitioner)

An undergraduate student who is in the last 15 graded credit hours of a bachelor's degree program and who is completing all requirements for graduation, may take up to six credits of graduate level courses numbered from 450 through 598 for credit toward an advanced degree.

The student must also (1) have a cumulative grade-point average of 3.0 or higher or have a grade-point average of 3.0 or higher in the last 45 credits completed; (2) complete the Senior Petitioner Forms of Graduate Student Services at least 30 days prior to registration; (3) once accepted as a Senior Petitioner, they must file a Senior Petitioner Course Form for each course by the deadline to add courses for the semester in which the course is to be taken and obtain approval from the graduate instructor, and the undergraduate advisor; and (4) register for the course at Graduate Student Services.

The combined total of graduate and undergraduate courses for the semester may not exceed 17 credits. Senior petitioners must consult with an admission representative at Graduate Student Services.

As a senior petitioner in a graduate program, the course(s) will become part of the graduate record and will not be used in the calculation of the student's undergraduate grade-point average or credit hours.

For students enrolled in a joint bachelor's and master's degree program see the subsection "Transfer of Undergraduate Credits to an NMSU Graduate Program" in the "Requirements for Enrolled Students" section of the Graduate Catalog.

Nondegree Admission

Nondegree admission is designed to meet the needs of students who do not wish to pursue a degree at this university or who have not yet completed the application process to a specific department. It should be noted that enrollment in some graduate-level courses is restricted to students accepted into specific programs. Academic advising for nondegree students should be obtained from the department or program of interest to the student. After meeting this requirement, upon receipt of a readmission application the student's records will be resubmitted to the department of choice for a decision as to admission. Not more than three courses totaling 9 credits or fewer earned in nondegree status

at NMSU may be transferred to a graduate program. NMSU does not recognize graduate credit for nondegree work from institutions other than the University of New Mexico (UNM), from which 6 credits may be accepted with the approval of the appropriate department, the college dean, and the graduate dean. Therefore, any student who has previously been accepted and enrolled in the Graduate School at NMSU should not change to a nondegree program unless it is the intention never to pursue further studies leading to an advanced degree.

Students on nondegree status are not eligible to receive financial aid, student employment, or institutional tuition waivers; nor are they eligible to participate in student government or intercollegiate athletics; nor are they eligible to receive benefits from any veterans' program.

Visiting Student

A visiting student is one who is taking graduate credits for transfer to his or her parent institution. An "Application for Admission" to Graduate Student Services and the application fee must be submitted 30 days prior to registration. The student must also have a letter sent from the parent institution's graduate dean indicating that he or she is admitted to that institution, is in good standing, and that the courses taken at New Mexico State University are acceptable to the parent institution. A visiting student will not be required to submit transcripts; however, the department must concur and admit a visiting student. Please note that the department may require other materials to be submitted before admitting a visiting student. Visiting students will not be eligible for undeclared status or for graduate assistantships.

Out-of-State Students and Legal Jurisdiction

By applying for admission/enrollment, both the student and parents agree that New Mexico law prevails and all litigation will be in federal court in New Mexico or in state court in Dona Ana County, New Mexico.

Graduate Certificate Student

A graduate certificate student is enrolled in a certificate program only. The student is not enrolled in any graduate degree seeking program of NMSU. The students' status can change if they apply and are accepted into a graduate degree program. Students currently enrolled in a graduate degree program can also be enrolled in a certificate program. However, their student status will be determined by the degree program. Graduate certificate students are not eligible for graduate assistantships. Completing courses as part of a certificate program does not guarantee admissions into a graduate degree program. The department makes the final decision on admissions into a degree program.

TUITION, FEES AND OTHER EXPENSES

All costs are given for one term. The University reserves the right to change any of the charges without notice.

GRADUATE TUITION AND REQUIRED FEES

	New Mexico Residents	Non-Residents
Fall or Spring Term		
12-18 credits (full-time).....	\$3,139.20.....	\$9,360.00
7-11 credits, per credit or over 18 credits.....	261.60.....	780.00
1-6 credits, per credit(6 credit max).....	261.60.....	261.60
Summer Term		
9 to 12 credits (full-time).....	\$2,354.40.....	\$2,354.40
1-8 credits, per credit or over 12 credits.....		261.60
Tuition and fees for auditing classes are the same as above. Short courses, workshops, and institutes are treated as completely separate sessions with varied credit rates.		
Additional Fees		
Graduate admission application fee		\$30.00
International student admission application fee		50.00
International student orientation fee.....		50.00
Distance education course fee (per credit)		25.00
ASNMSU Fee (Fall / Spring 1-11 credit enrollment)		33.50
ASNMSU Fee (Summer 1-8 credit enrollment)		12.40
Graduate Wellness/Fitness fee—(Fall/Spring 9-11 credits).....		15.50
Course examination fee (per credit).....		261.60

Certificate degree fee.....	10.00
Bachelor or Associate degree fee.....	25.00
Master or Doctorate degree fee.....	35.00
Degree application late filing fee.....	25.00
Thesis binding fee (3 copies).....	38.50
Late Registration Fee Base Cost.....	25.00
Thesis binding molecular biology / astronomy majors (4 copies).....	48.50
Dissertation microfilming/binding fee (3 copies).....	79.00
Dissertation molecular biology / astronomy majors (4 copies).....	89.00

Course Fees (fees assessed per course)

See each term’s Schedule of Classes or lists of courses with additional fees. Applied Music courses - see Music section of catalog.

Mandatory International Student Fees

All international students are required to have Student Health Center coverage and to purchase the student accident and health insurance unless otherwise covered by comparable health and accident insurance approved by the International Student Services. International students will be required to purchase health insurance for spring and summer during spring registration unless they have applied for spring graduation. All International graduate assistants are required to have supplemental health insurance. (See below optional fees for costs)

OPTIONAL FEES

Wellness/Fitness Fee

The Wellness/Fitness Fee is included in tuition for Las Cruces Campus full-time students. Options for part-time students enrolled at Las Cruces campus include:

	Wellness	Fitness
Term pass for student enrolled in 6-11 credits	\$79.00.....	\$40.00
Term pass for student enrolled in 1-5 credits	105.00.....	53.00
Single visit for student enrolled in 1 – 11 credits.....	35.00.....	5.00

The Wellness fee grants access to the Student Health Center with charges accruing for medications, lab work, testing or procedures. The Fitness fee grants access to the Student Activity Center.

Supplemental Health Insurance

Students who have access to the Student Health Center may choose to purchase a commercial insurance policy endorsed by NMSU. This insurance is intended to supplement the Student Health Center service. Dependent coverage is not available through NMSU but may be purchased directly from the insurance company; however, dependents of students are not eligible to use the Student Health Center. Insurance information is available at <http://www.uhcsr.com>.

Graduate Assistant Health Insurance Benefit Program

New Mexico State University offers health insurance to graduate assistants including teaching assistants, research assistants and graduate assistants employed by student services and other support units on campus. The University covers seventy percent of the cost of the health insurance plan and graduate assistants cover the remaining thirty percent. To be eligible for the Graduate Assistant Health Insurance Benefit Program, graduate assistants must:

- a) work at least 10 hours per week for an academic term (.25 FTE) in a salary position of NMSU;
- b) be a full-time graduate student enrolled in at least 9 graded credits from NMSU;
- c) be in good academic standing; and
- d) complete the online NMSU Graduate Assistant Health Insurance Benefit Program enrollment form.

NMSU’s Graduate Assistant Health Insurance Benefit Program is managed by United Healthcare Student Resources. UHCSR is a market leader in student insurance programs. For more information, visit their website, <http://www.uhcsr.com>. Spouse and children coverage can be obtained by enrolling in a separate plan with UHCSR (see their web site for enrollment information).

International graduate assistants are required to have health insurance. International graduate assistant students can enroll in the Graduate Assistant Health Insurance Benefit Program listed above. For more information, please see <http://hr.nmsu.edu/benefits>.

Housing Services

See “Resources For Students” section for room descriptions, accommodations, application process, deposit requirement, regulations, and eligibility.

	Fall/Spring	Summer
Double Occupancy (Monagle).....	\$1,742.00.....	n/a
Double Occupancy (Garcia Hall).....	1,915.00.....	n/a
Double Occupancy (Pinon Hall).....	2,132.00.....	n/a
Double Occupancy, Suite Bath(RGH)	1,824.00.....	n/a
Double Occupancy, Community Bath(RGH)	1,629.00.....	n/a
Single Occupancy (Garcia).....	3,064.00.....	n/a
Single Occupancy (Monagle)	2,787.00.....	n/a
Single Occupancy, Suite Bath (RGH).....	2,918.00.....	n/a
Single Occupancy, Community Bath (RGH)	2,606.00.....	n/a
Four Bedroom Apartment (Cervantes Village)	1,976.00.....	1,624.00
Four Bedroom (Chamisa Village).....	2,421.00.....	1,990.00
Two-Bedroom Apartment (Cervantes Village).....	2,092.00.....	1,720.00
Two-Bedroom Private Apartment (Cervantes Village).....	3,139.00.....	2,580.00
Two-Bedroom Apartment (Vista del Monte)	2,237.00.....	1,839.00
Two-Bedroom Private Apartment (Vista del Monte).....	3,356.00.....	2,759.00
Two-Bedroom (Chamisa Village)	2,766.00.....	2,274.00
Efficiency Apartment (Cervantes Village).....	2,160.00.....	1,776.00
Graduate Community per month (Vista del Monte)	808.00.....	808.00
Student Family Housing (per month).....	630.00.....	630.00
Family Housing Four-Bedroom		
(Cervantes Village, per month).....	856.00.....	856.00

Dining Services

See “Resources for Students” section for meal plan descriptions, application process, deposit requirement, regulations, and eligibility.

	Fall/Spring	Summer
Meal Plan A (unlimited entrances + 100 flex points)	\$1,395.00.....	n/a
Meal Plan B (225 entrances + 150 flex points)	1,395.00.....	n/a
Meal Plan C (165 entrances + 200 flex points)	1,395.00.....	n/a
Aggie Plan (82 entrances + 100 flex points).....	683.00.....	n/a
Pete’s Plan (50 entrances + 100 flex points).....	463.00.....	n/a
Crimson Plan (14 entrances + 175 flex points)	276.00.....	n/a

Late Registration Penalties

A late registration penalty of \$25 will be assessed for course registrations processed during a term’s late registration time period. Failure to make scheduled payments with the University Accounts Receivable on due dates may result in additional liability.

PAYMENT OF CHARGES

By enrolling in classes at NMSU, a student makes a financial commitment to pay the tuition and fee charges associated with that enrollment. The enrollment action constitutes a financial obligation between the student and NMSU and all proceeds of this agreement will be used for education purposes and constitutes an education loan pursuant to 11 U.S.C. § 523(a) (8). Terms and Conditions of Course Registration are posted on the NMSU website and available in each term’s class schedule. Payments can be made by mail, web, telephone, or in person at the University Accounts Receivable. Cash, checks, money orders and limited types of credit cards are accepted. Term charges can be paid in full or paid by using a payment plan. Students utilizing the payment plan for the Fall and Spring terms will have the balance due in four equal monthly installments within the term. Summer terms have two installments within the term. A payment plan fee of \$20.00 is assessed to students using the plan for each campus enrolled. All financial aid received must be paid towards balances owed. Additional penalty charges may be assessed for failure to make payments when due. The University reserves the right to deny a payment plan to any student who has a poor credit rating or who has been negligent in making payments to the University for previous debts. Course reservations may be cancelled if payment arrangements for past due debts are not completed by the deadlines as outlined in a term’s class schedule. Academic credits, transcripts, and diplomas will be withheld until all financial obligations are paid. Students are prohibited from registering for a term until all previous debts due to the University are paid in full.

TUITION ADJUSTMENTS, REFUND, AND FORFEITURES

Any student officially dropping or withdrawing from a course or courses during a term may receive tuition and fee adjustments as outlined in the current class schedule. No tuition adjustments will be made on classes of less than five weeks' duration. **Non-attendance does not constitute official course drop or withdrawal. All charges due to the University must be paid before refunds will be permitted.**

In cases of academic or disciplinary suspension, eligibility for tuition adjustments will depend on the conditions of the suspension and will be entirely at the option of the University. Should unforeseen circumstances beyond the reasonable control of the University result in curtailing classes, closing residence facilities, or otherwise withdrawing services that are a normal function of NMSU, refunds of any nature will be at the discretion of the University administration.

Residence hall rentals and dining hall charges may be refunded in accordance with schedules adopted by these departments.

DISHONORED FINANCIAL TRANSACTIONS – CHECKS, CREDIT CARDS, ACH TRANSACTIONS

The University charges a penalty on all dishonored cash instruments. Personal checks will not be accepted from students who have had previously dishonored checks.

ESTIMATING OTHER EXPENSES

In addition to the direct costs stated above, other expenses per term may include such items as textbooks and supplies (estimated at \$500) and personal expenses (estimated at \$660).

Cooperative Education

Students participating in the Cooperative Education Program who receive academic credit pay the same tuition and fees as regularly enrolled students. Work phase students who are assigned to campus or nearby off-campus workstation may purchase the student wellness/fitness optional fees the same as a part-time student enrolled in 1 to 5 credits.

RESIDENT, NONRESIDENT STATUS

Resident or nonresident status is determined in accordance to a uniform definition established for all New Mexico institutions by the Higher Education Department, State of New Mexico. The NMSU Registrar's Office administers residency.

Active duty members of the Armed Forces, their spouses and minor children not otherwise entitled to claim residency, are eligible for tuition payment at the resident student rates upon presentation of a certification from their commanding officer of assignment to active duty within New Mexico. Certification is required upon initial registration.

Information on the following programs may be obtained from the Office of Admissions:

- Residents of Texas who reside in Texas within 135 miles of the NMSU-Las Cruces campus may be eligible for a special tuition rate for the Las Cruces campus only.
- American Indian nations, tribes and pueblos. All out of state members of an American Indian nation, tribe, and pueblo, located wholly or partially in New Mexico, regardless of the residence of the member prior to acceptance at a post-secondary educational institution shall be eligible to pay the in-state tuition rate. These include members of the following tribes or pueblos: Jicarilla Apache, Mescalero Apache, Taos pueblo, Picuris pueblo, Ohkay Owingeh, Santa Clara pueblo, Nambe pueblo, Navajo tribe, San Ildefonso pueblo, Pojoaque pueblo, Tesuque pueblo, Cochiti pueblo, Jemez pueblo, Santo Domingo pueblo, San Felipe pueblo, Zia pueblo, Santa Ana pueblo, Sandia pueblo, Isleta pueblo, Laguna pueblo, Acoma pueblo, Zuni pueblo, and the Ute Mountain tribe.
- The Western Interstate Commission for Higher Education (WICHE) allows students in western states to enroll in college programs at a special tuition rate.

Students interested in dentistry, veterinary medicine, occupational therapy, optometry, osteopathy, podiatry, forestry, graduate library studies, graduate nursing education, and public health should see the paragraph on Western Interstate Commission for Higher Education in the "Resources for Students" section.

VETERAN STUDENTS

See section Military/Veterans and Family Members

FUNDING OPPORTUNITIES

In selecting individuals for any assistantship or fellowship, and in the administration of appointments, New Mexico State University will not discriminate on grounds of age, ancestry, color, disability, gender, national origin, race, religion, sexual orientation, or veteran status.

The Graduate School offers awards, assistantships, and fellowships to qualified graduate students. All awards require faculty nominations. Current students and admitted students can request the faculty or the department head to nominate them for the awards of the Graduate School.

Below is a summary of those awards. For detailed information and the application process and deadlines please consult <http://gradschool.nmsu.edu/gradschool/announcements.html>.

Most graduate assistantships offered by New Mexico State University are awarded by the students' academic department. We suggest that you contact the department of study to receive information on graduate assistantships, fellowships, and internships. The student must be admitted to the Graduate School before a request for an assistantship or fellowship will be considered by the department or the Graduate School.

The university limits the number of years a student may be supported on funds from the state of New Mexico. A student should check Graduate Assistant Employment Guidelines of the Graduate School at the following web site: <http://gradschool.nmsu.edu/ga/index.htm>. Departments may place additional limitations on the years of support.

AWARDS OF THE GRADUATE SCHOOL

Merit-based Enhancement Fellowships for Current Graduate Assistants

To help departments reward outstanding graduate assistants, the Graduate School offers Merit-Based Enhancement fellowships to graduate assistants who are engaged in the teaching or research mission of New Mexico State University. The amount of the awards is \$4,000 for an academic year.

Nominations must come from faculty and are due at the Graduate School on April 1st. Please contact the dean of Graduate School if you have any questions, (575) 646-5746 or lacey@nmsu.edu.

The Mike Watts Outstanding Leadership Graduate Fellowships of \$2,000

The Graduate School encourages faculty to nominate outstanding graduate assistants for a Mike Watts Outstanding Leadership award. The fellowship is made available through the generosity of the family and friends of Michael E. Watts. The Watts Fellowships are available to graduate assistants from any area of Graduate School.

If awarded, the fellowship will be paid as salary supplement to the regular assistantship. Please note that for those students who also receive financial aid, the fellowship can have an impact on the amount of financial aid received. Nominations from faculty are due April 1st. The Graduate School will review the applications and select recipients.

Graduate Assistant Tuition Fellowships

The Graduate School awards tuition fellowships to graduate assistants to help departments recruit outstanding graduate students to their programs.

Master's degree students will receive up to 2 years of support and doctoral degree students will receive up to three years of support. In order for students to qualify for a second and third year of support, they must maintain their status as graduate assistants for the duration of the tuition fellowship period. These awards are for students receiving 10 hour and 20 hour graduate assistantships. The tuition fellowships do not include fees.

Nominations from faculty are due to the Graduate School by April 1st.

Please contact the dean of the Graduate School if you have any questions, (575)-646-5745 or lacey@nmsu.edu.

McNair Graduate Assistantships

The Graduate School wishes to support and recognize the success of the McNair program by offering several McNair Graduate Assistantships for one academic year with a match of one year from a department. Nominations from faculty are due to the Graduate School April 1.

State Department of Higher Education (HED) Graduate Scholarship Programs

The Higher Education Department Graduate Scholarship Program offers Graduate Fellowships/Assistantships for women and minority persons who are citizens or permanent U.S. residents and who are a first year student or a student

that is beginning graduate studies in any graduate department at the master's or doctoral level at NMSU. The selected student must be admitted to a graduate program prior to applying for this award.

HED fellowships carry stipends of \$7,200 per annum and matched with half-time (10 hours per week) teaching assistantship provided by the student's department for a total award of \$15,800.

The total amount of this award is based on the salary for a 20 hour graduate assistantship and usually increases from year to year, based on raises awarded by the State of New Mexico.

Fellowships are available for two years for master's students and four years for doctoral students. One of the HED fellowships is, when possible, designated for a McNair Scholar. Eligible nominees will be judged using the following criteria:

In order for the student to establish financial need, students must complete a Free Application for Federal Student Aid (FAFSA) form available in the Financial Aid Office. This form is not to be returned to the Graduate School. The form must be mailed to the Federal Student Aid Programs address listed on the application or submitted via computer at the Financial Aid Office. The results will be sent to the student and the Financial Aid Office. ***Students must have a complete file and have been approved for financial aid to be considered for this fellowship.*** Preference will be given to those students that have a current FAFSA form on file at the NMSU Financial Aid office.

Nominations from faculty should be sent to the Graduate School as soon as possible but no later than April 30th.

Diversity Graduate Assistantships

The diversity awards are allocated to departments on a competitive basis to help increase the diversity and quality of the student body. Matching support is required to win one of these awards for your student. The diversity award can be used to recruit domestic students. Please note that the award is for an academic year. Departments will need to commit funds to the selected student for at least one additional semester, or preferably a year.

The selected student must be admitted to the department prior to applying for the diversity award.

The Graduate School will accept applications from faculty until April 1. Please direct inquiries to the dean of the Graduate School at (575) 646-5745 or lacey@nmsu.edu.

Fellowships

The Graduate School maintains a Fellowship and Grant Information Web page <http://gradschool.nmsu.edu/fellowships/> which provides a database of grants, fellowships, and assistantships for graduate students. The university offers a number of fellowships available to both new and continuing students.

Assistantships

Graduate assistantships in teaching and research are available primarily through the department in which the student is enrolled. Eligibility for teaching assistantships includes (a) acceptance by and subsequent registration in the Graduate School and academic department, (b) classification as a "regular" graduate student, (c) enroll in and successfully complete nine graded credit hours each semester and (d) maintain a 3.0 grade-point average. Provisional students can be hired as research assistants but not as teaching assistants.

Graduate students accepted on a provisional basis cannot serve as teaching assistantships. However, they can serve as research assistants. Eligibility includes (a) acceptance by and subsequent registration in the Graduate School and academic department, (b) classification as a "provisional" graduate student (c) enroll in and successfully complete nine graded credits hours, and (d) funded on research projects of the faculty of NMSU.

A student seeking appointment as a teaching assistant will be required to demonstrate proficiency in communication skills necessary for satisfactory service in the classroom. All graduate students given an assistantship must attend a mandatory orientation offered by the Graduate School. Departments may also require students to complete workshops/orientations in order to qualify for assistantships.

All international students seeking a teaching assistantship must demonstrate proficiency in English and competency in pedagogy. Prior to the first semester in which the teaching assistantship is to be received, international students must undergo the NMSU International Teaching Assistant (ITA) screening administered by the Department of Communication Studies on behalf of the Graduate School. Students who pass the screening exam are immediately eligible for assignment to a teaching assistantship. Those who do not pass the

screening exam must enroll in and satisfactorily complete COMM 485 before being eligible for a teaching assistantship. To aid those incoming international students who plan to teach in the fall semester, COMM 485 is offered in the summer. International graduate students wishing to hold a teaching assistantship should check with their department to determine when they should arrive on campus to meet the screening requirement. International students who don't pass the screening exam may be eligible to serve as graders for their academic departments. The academic departments must receive approval from the Graduate School in order to hire these students.

The duties involved normally require about 20 hours per week (full time fall and spring) of the student's time. By accepting an assistantship, the student is obligated to enroll for and maintain enrollment in a minimum of nine graded graduate credits (courses numbered 450 and above) per semester, but not more than 15 per semester. A graduate assistant may not enroll for more than 15 credits for each fall and spring semesters. Courses taken for audit or undergraduate deficiencies are counted in the maximum total course load; audited classes and courses under 450 cannot be used for the minimum GA course load requirement.

GRADUATE ASSISTANTS SALARIES AND TAX WITHHOLDING GUIDELINES

Internal Revenue Service tax withholding guidelines require undergraduate and graduate students employed through New Mexico State University maintain at least six credit hours of course work during the fall and spring semesters and three credit hours of course work for summer sessions to be eligible for the student FICA tax exemption. Student employees who do not meet this requirement during any given pay period will be subject to Social Security taxes at the rate of 6.2% and Medicare taxes at the rate of 1.45%. Salaries for graduate assistants in 2010-2011 are as follows:

Level	Salary
I	\$15,800
II	\$16,000
III	\$16,200

Level I applies to students pursuing a master's degree. Level II applies to students (a) pursuing the education specialist or doctoral degree who have passed the qualifying exam or (b) who have a master's degree in the same or cognate field and the recommendation of the head of their major department. Level III applies to a doctoral student who has passed the comprehensive examination.

Graduate assistants employed at least ten hours per week will be given in-state tuition during the first 12 months of tenure if the hiring process is approved by Human Resources prior to census date (stated by the Office of the Registrar as the third Friday of the semester each spring and fall semester).

If New Mexico resident status has not been established by the time of any reappointment, the graduate assistant may be subject to nonresident tuition rates.

Applications for state residency may be obtained in the Office of the Registrar, Located in the Educational Services Building.

SOCIAL SECURITY NUMBERS IN STUDENT RECORDS

As required by law, social security numbers are collected from prospective and current students who 1) plan to seek employment on campus or 2) wish to receive financial aid. In addition, the university is mandated by federal tax regulations to provide tuition and fee payment information to the student and the Internal Revenue Service, so that applicable educational tax credits may be computed. The social security number will be necessary to submit this tax reporting. The social security number is a confidential record and is maintained as such by the university in accordance with the Family Educational Rights and Privacy Act.

In order to be employed by New Mexico State University all students must have obtained a social security number within eight weeks of being hired or risk losing their assistantship.

When an official social security number is issued to an international student, it is the student's responsibility to inform Human Resources or the Office of the Registrar as soon as possible.

HOURLY WORK

Eligibility for student payroll requires that a graduate student (a) be admitted to the Graduate School as well as to a department, (b) have a GPA of 3.0, and (c) be enrolled for at least nine graded graduate credits (courses numbered 450 and above). A student may not work more than 20 hours per week during the aca-

demic year. Students should check with Student Employment Services, Garcia Annex, Room 204, for current job postings.

Students not classified as residents of New Mexico but working at an hourly rate are not eligible to receive in-state tuition.

FINANCIAL AID

The mission of the Office of Student Financial Aid and Scholarship Services at New Mexico State University (NMSU) is committed to providing a high level of service to support students in achieving their academic goals by helping to remove the financial barriers to college attendance. The office's mission is to offer coordinated delivery of comprehensive student aid programs that are supportive of the recruitment and retention of academically talented and diverse students. Although primary responsibility for educational cost rests with the student and his or her family, NMSU, the federal government, and the state of New Mexico all contribute to assist students pursuing higher education.

The Office of Student Financial Aid and Scholarship Services administers a broad spectrum of loans and work-study in an attempt to meet the financial needs of the university's students. The Office of Student Financial Aid and Scholarship Services awards financial aid to students according to their individual needs. Students and spouses, if applicable, are expected to contribute from their own assets and earnings, including appropriate borrowing against future income. All information provided to the Office of Student Financial Aid is regarded as confidential.

Students applying for financial aid complete a "Free Application for Federal Student Aid" (FAFSA) designed to determine, in accordance with state and federal guidelines, the difference between what the student or family is expected to contribute and the cost of attending NMSU. Among the factors that determine the family's expected contribution are (1) annual adjusted gross income as reported to the Internal Revenue Service; (2) savings, stocks, or bonds; (3) other assets in the form of a business, farm, or real estate; (4) nontaxable income and benefits; and (5) student's prior year income and assets. Students applying for financial aid should complete a FAFSA by visiting <http://fa.nmsu.edu> or <http://www.fafsa.ed.gov/>.

Please refer to our Web site for more information on financial aid. A complete listing of programs and policies is available on-line.

GENERAL ELIGIBILITY REQUIREMENTS

To receive financial aid a student must:

- Be a U.S. citizen or an eligible non-citizen.
- Enroll at least half time (as defined by federal regulation); this applies to most Title IV programs.
- Enroll in an eligible major.
- Enroll in eligible courses.
- Maintain satisfactory academic progress defined by federal regulations.
- Not be in default on any federal educational loans or owe a refund on a grant.
- Sign a statement of educational purpose, stating that the money will be used toward educational purposes only.

SOURCES OF FINANCIAL AID

Loans. Available to undergraduate and graduate students with financial need, Federal Perkins Loans are long-term, low-interest loans (5% fixed interest rate) that must be repaid to the university according to federal guidelines. Repayment of Federal Perkins Loans begins nine months after graduation or after enrollment drops below half time.

Federal Family Education Loans which include subsidized and unsubsidized Federal Stafford Loans are need-based, long-term loans available to undergraduate and graduate students. Students receiving a subsidized or unsubsidized Federal Stafford loan or a Perkins loan must complete the financial literacy and entrance counseling sessions by clicking on the links at <http://fa.nmsu.edu/financial-aid-how-tos/index.html> before NMSU will issue a check. In addition, students must complete an exit interview upon graduation or withdrawal from the university. Repayment of a Stafford loan begins six months after graduation or six months after enrollment drops below half time. Effective July 1, 2008 the interest rate on new Stafford loans vary according to the year the loan is disbursed. More information will be available at the time the loan is made.

Work-Study Programs. The Federal Work-Study Program provides employment opportunities for selected undergraduate and graduate students with demonstrated financial need. The New Mexico Work-Study Program also provides employment opportunities for students; however, only New Mexico residents are eligible to participate in the program.

FINANCIAL AID AWARDS

All financial aid awards are based on information provided by the student and spouse, if applicable, availability of funds, and eligibility requirements. Any award may be revised based on changes in enrollment, cost of attendance, outside resources, family contribution, or failure to meet satisfactory academic progress. Withdrawals or reductions in enrollment may affect an award or any future awards. Financial aid will not pay for audited courses or for classes in which credit will not be received.

FINANCIAL AID SATISFACTORY ACADEMIC PROGRESS

Federal regulations require that financial aid recipients meet certain academic standards to be eligible for federal financial aid. To ensure that financial aid recipients are making satisfactory academic progress, academic transcripts are reviewed at the end of each term to determine eligibility for the next term. All terms of attendance are reviewed, including periods in which the student did not receive financial aid. All transfer work is taken into account when satisfactory progress is reviewed. In addition, repeated courses are included in the academic progress calculation.

Grade Point Average. Graduate students must maintain a cumulative grade point average of at least 3.0 (a B average). Grade point values are: A = 4.0, B = 3.0, C = 2.0, D = 1.0, F = 0. Grades of I, CR, RR, PR, NC, W, and AU are not calculated in the GPA.

Completion Rate. Students must complete a minimum of 2/3 of all course work (registered credit hours) attempted at NMSU. Any course with a grade of Withdraw (W), Incomplete (I), Repeats (RR), Failure (F), Audit (AU), or No Credit (NC) is not considered completed course work. Repeated courses are included in the calculation for GPA or minimum completion.

Maximum Time Frame. Graduate students must complete their program within 200 percent of the credit hours required by the program. Students who have reached the maximum allowable time will be suspended from receiving financial aid. Total attempted hours including repeated courses and transfer course work are included in the student's maximum time frame calculation.

FINANCIAL AID SUSPENSION

Students are suspended from receiving financial aid if they do not meet satisfactory academic progress standards. Students on financial aid suspension will not receive any form of federal or state financial aid (grants, loans, work study). When all standards of satisfactory progress are met, you may contact your Financial Aid Office to have your financial eligibility reinstated.

THE APPEALS PROCESS

Students suspended from financial aid may appeal the suspension if there are mitigating circumstances affecting their progress. Students who would like to appeal the suspension must submit an appeal form and all required documentation to the Office of Student Financial Aid. A committee will review the appeal and may grant reinstatement of financial aid based on mitigating circumstances that directly contributed to deficient academic performance. Appeals are usually evaluated on a term-by-term basis.

REGISTRATION

Graduate students may register in person at Graduate Student Services or on the Web at <https://my.nmsu.edu>. No person will be officially registered unless formally admitted to the Graduate School.

CHANGE OF ADDRESS

In order to assure accurate student records, **students are responsible for keeping Graduate Student Services and the Office of the Registrar informed of the following:** Changes in residence and mailing addresses; current telephone numbers, and primary e-mail addresses. Failure to do so may result in tran-

scripts, diplomas, or other important communications from the university not being received in a timely manner.

The deadlines for registration and for the add/drop period are printed in the Schedule of Classes and are available on-line at <http://gradschool.nmsu.edu/deadlines/index.htm>.

INTERNATIONAL STUDENTS

English Proficiency

International students that wish to become teaching assistants must prove that they are proficient in the English language. During summer session II preferably or before the start of the first semester of enrollment, each international student who is required to submit a TOEFL (Test of English as a Second Language) or an IELTS (International English Language Testing System) score that wishes to be considered for a teaching assistantship must also take the Academic English Proficiency Test administered by the Department of Communication Studies. Also, students who successfully complete and pass approved English as a Second Language (ELS) course, and who wish to become a teaching assistant must also take the Academic English Proficiency Test administered by the Department of Communication Studies. Based on the recommendation of the Department of Communication Studies, the Graduate School may require the student to successfully complete one or more English as a foreign language course(s) prior to beginning an assignment as a teaching assistant. If completion of one or more courses is required, the student should enroll in the first such course during his or her first semester at NMSU or prior to taking an assignment as a teaching assistant.

Enrollment

All international graduate students on F-1 or J-1 visas are required to comply with Department of Homeland Security regulations governing maintenance of status related to full-time enrollment and making normal progress toward completing a degree. Therefore, all international graduate students are required to enroll in nine or more credits (exclusive of audited work) during fall and spring semesters.

SHORT COURSES AND INSTITUTES

Short courses and institutes are conducted on the campus each summer and during the academic year. Courses numbered 450 and above have been approved to carry graduate credit for students regularly enrolled in the Graduate School. Registration is required to receive graduate credit for these courses.

Concurrent enrollment of graduate students in regular and short courses is allowed provided that the combined credits do not exceed 15 in a fall or spring semester.

All short courses carrying one semester credit will be graded on an S/U basis, and these S/U credits will be counted toward the student's limit of S/U credits.

SUMMER SCHOOL SESSIONS

During the summer session, the maximum number of graduate credits a graduate student may take is 9. If the student wishes to enroll in more than 9 credits in the summer, they need to write an appeal letter addressed to the Dean.

APPLICATION FOR A CERTIFICATE

Completion of a Graduate Certificate Program

You must meet several requirements to receive your Graduate Certificate. These requirements are listed below. You can also find more information about receiving your Graduate Certificate at the FAQ – Certificate Programs link: <http://gradschool.nmsu.edu/certificates.html>

1. Submit an Application for Certificate: This form is submitted directly to Graduate Student Services, along with the Application for Certificate fee of \$25. The form can be found here: <http://gradschool.nmsu.edu/forms-index.html>.

The deadlines for submitting this form are as follows:

October 1st for December certificate

February 15th for May certificate

May 15th for August certificate

Note: Late applications are automatically transferred to the next award period.

2. You must be enrolled or pay the special Exam Fee: You need to be registered for at least one credit during the semester in which you plan to complete your Certificate. If you are not registered, you must pay the Exam Fee: <http://gradschool.nmsu.edu/forms/ExamFeeForm.pdf>
3. Approved Program of Study: You must also fill out a Program of Study for your Graduate Certificate Program. These forms are specific to each Graduate Certificate Program and can be found at this website, under Forms for Graduate Certificate Programs: <http://gradschool.nmsu.edu/forms-index.html>.
4. Grade Point Average of 3.0: You must have an overall GPA of 3.0 to receive your Certificate.

MILITARY/VETERAN & FAMILY MEMBERS

STUDENT SERVICES

All Things Military

All Things Military promotes lifelong learning and professional development for military members and their families, both nationally and at our expanding regional military bases. This program promotes compatibility between NMSU's academic and administrative practices with those used by the military's education system, ensuring convenient and affordable educational access.

NMSU is a military-friendly university. As an institutional member of the Servicemembers Opportunity College (SOC), NMSU in Las Cruces and its four community college campuses in Alamogordo, Carlsbad, Doña Ana and Grants are committed to assisting the men and women of the armed services and their dependants pursue their goals in higher education by offering:

- Affordable, in-state tuition rates for military personnel and their families living at regional military installations
- Transferable credits that count toward degrees at NMSU
- GoArmyEd participant
- Courses taught online and at locations on and near regional military installations
- A tradition of quality education

For further information, contact the Military Coordinator for Student Success at (575) 646-6216. Overview may be viewed at <http://extended.nmsu.edu/military/index.html>.

TUITION, FEES AND OTHER EXPENSES

Veterans

Veteran students enrolled under the following programs are responsible for their tuition and fees in the same manner as a non-veteran student:

- Montgomery GI Bill-Active Duty (CH30)
- Dependents (CH35)
- Montgomery GI Bill - Selected Reserve (CH1606)
- Reserve Educational Assistance Program (REAP)

Tuition and fees of students enrolled under the Vocational Rehabilitation Program (CH31) will be paid by the U.S Department of Veterans Affairs under contract with the university.

Post 9/11 (CH33) payments are based on the benefit level which can range from 40% to 100%. Tuitions and allowable fees of students enrolled under the Post 9/11 (CH33) will be paid directly to New Mexico State University by the Department of Veterans Affairs under contract with the university. If the student's benefit level is below 100%, the student is responsible for the remaining tuition and fees in the same manner as a non-veteran student.

REGULATIONS AND PROCEDURES FOR STUDENTS

GoArmyEd

Soldiers must first be admitted to NMSU before they may enroll in any classes at NMSU. Only enrollments verified through the GoArmyEd portal will be eligible for Tuition Assistance (TA). It is the soldier's responsibility to process all class withdrawals through both GoArmyEd and NMSU systems in accordance with institutional policies and procedures. For further information, contact the Military Coordinator for Student Success at (575) 646-6216.

VETERANS' ATTENDANCE AND SATISFACTORY PROGRESS

The U.S Department of Veterans' Affairs requires all students receiving veteran education benefits to make satisfactory progress and systematic advancement toward an educational objective or be liable for overpayments from the U.S. Department of Veterans Affairs. Satisfactory progress and regular class attendance are expected of such students.

If a veteran receiving benefits is suspended for academic reasons, benefits are terminated and will be restored only after readmission to the Graduate School.

If the university has liability claims filed against it as a result of a veteran failing to meet compliance requirements of the U.S. Department of Veterans Administration, the university will not release any academic records on the veteran until such time as the veteran has reimbursed the federal government for funds drawn in violation of those requirements.

A student receiving VA benefits who is pursuing a degree program offered by New Mexico State University should adhere to the curriculum of that program. Failure to do so will result in the student being certified for less than full-time status or becoming liable for an overpayment.

Military Withdrawal

The following steps must be taken by all New Mexico State University graduate students called up for active duty who wish to withdraw from all their classes:

- a) Office of Veterans Programs. Students receiving VA students education benefits ordered to Active Duty must provide a copy of orders to the Office of Veterans Program, Jacobs Hall, Room 214. To assist in reporting accurate information to the VA Regional Office, student should also provide, in writing, last day of class attendance.
- b) Office of the Registrar. All students presenting their orders to the Office of the Registrar, (575) 646-3411, will receive a military withdrawal from classes and a full tuition and fees refund for that semester.
- c) Bookstore. Students who still have their receipts for textbooks purchased the semester in which they are called to active duty will be given a full refund for these textbook purchases when they present their orders. (575) 646-4431.

Military Leave of Absence

If students present their orders to the Graduate School they will be granted a leave of absence for the time stated on their orders. If the student's military service is extended beyond the original request and if the student provides a copy of the military orders to that effect, the Graduate School will do all in its power to have that time not count toward the seven-year time limit to complete requirements for the master's degree. The Graduate School expects all students released from active military service to resume their studies within one year. After that one year, the clock will resume counting toward the seven-year limit for degree completion.

Spouses with a proper power of attorney may initiate and complete these processes on behalf of the student.

VETERANS PROGRAMS

NMSU degree programs are approved by the State Approving Agency Director for enrollment of persons eligible to receive education beliefs from the U.S. Department of Veterans Affairs.

For further information concerning approved programs and application process, eligible persons should contact the Veterans' Programs Office at Jacobs Hall, Room 214 or at (575) 646-4524 or through email at va@nmsu.edu.

Responsibility of Students Receiving VA Education Benefits

Students must be pursuing a degree in a specific program to be eligible to receive education benefits. Admission procedures for veterans and other eligible persons are the same as those for other students. Degree plans from advisors must be submitted prior to any verification of enrollment. For continued certification students must submit Concise Student Schedule to the NMSU Veterans' Programs Office.

Veterans must notify the Office of Veterans Programs when any one or more of the following occurs:

- Dropping or adding course(s)
- Withdrawing from course(s)
- Discontinuing regular class attendance
- Change in Programs (academic majors)

VA education benefits are payable for regular attendance in courses that are part of the veterans' program (major) curriculum. VA educational benefits are not payable for:

- Classes not attended regularly
- Repeat of a course for which a passing grade was received
- Classes for which credit is received through successful completion of a proficiency test or grade by examination
- Classes taken on an audit basis
- Classes that are dropped
- Classes taken that are not part of the veteran's program (major) curriculum

View our web page at: <http://www.nmsu.edu/va/>.

Military/Veteran Graduate Student Status

Veteran benefits are determined by the number of graded graduate credits of enrollment for a given semester or summer session. Listed below are the credit hours that determine student status for military veterans.

Fall and Spring semester: full-time enrollment includes 9 or more graded credit hours, students are considered three fourth time if they are enrolled in 7 to 8 credit hours. Half time enrollment is 5 hours. Veterans enrolled in less than 5 credits hours are reimbursed for tuition and allowable fees only.

There are several summer sessions. For the 10 week summer term, full-time enrollment is 6 credit hours and half time enrollment is 3 credit hours. During the five week term, full-time enrollment is 4 graded credit hours.

THESE REQUIREMENTS ARE STRICTLY FOR MILITARY VETERANS.

REGULATIONS AND PROCEDURES FOR STUDENTS

GRADING SYSTEM

Graduate students are expected to apply themselves intensively to the study of the material covered by the courses in which they are enrolled. Accordingly, a high level of performance is required. The student must maintain a grade-point average of at least 3.0 in all graduate courses taken as a graduate student at NMSU. Courses transferred from the undeclared program at NMSU or from other institutions will be included in determining grade-point averages.

Grades

The grades awarded in all courses are indicative of the quality of work done. Their significance is as follows:

Letter Grade	Point per Credit
A — For excellent work	4
B — For better than average work.....	3
C — For average work	2
D — For below average work.....	1
F — For failing work.....	0
W — Withdrawal.....	0
N — Grade not submitted	0
CR — Credit authorized, but not letter grade.....	0
IP — In progress.....	0
RR — Progress in undergraduate course	0
PR — Progress on graduate thesis	0
S — Satisfactory work.....	0
U — Unsatisfactory work.....	0
I — Incomplete.....	0
AU — Audit	0

Distinctions within a letter grade may be indicated by the use of plus or minus, and these will become part of the official record.

S Grade

An S grade is a grade satisfactory to the professor.

C, D, and F Grades

Although C grades earned at New Mexico State University may be counted toward the requirements for an advanced degree, this is not considered acceptable graduate-level performance.

Courses in which a student earns only a D or F may never be counted toward a graduate degree, although such grades are calculated in determining the grade-point average. Therefore, any grades of D or F must be compensated for by the necessary hours of A if the student is to have the 3.0 grade-point average required before awarding of the degree.

Incomplete Grade

The grade of Incomplete is given for passable work that could not be completed due to circumstances beyond the student's control. The following regulations apply to removing or changing an Incomplete grade:

1. Instructors may assign an Incomplete grade only if the student is unable to complete the course due to circumstances beyond the student's control that develop after the last day to withdraw from the course. Examples of appropriate circumstances include documented illness, documented death or crisis in the student's immediate family, and similar circumstances. Job related circumstances are generally not appropriate grounds for being assigned an Incomplete. In no case is an Incomplete to be used to avoid the assigning of D, F, or Unsatisfactory grades for marginal or failing work.
2. To assign an /grade, the instructor must complete the /Grade Information Form and have the form delivered to the course dean, together with the instructor's grade sheets for the semester. The instructor will state in writing on the /Grade Information Form the steps necessary to complete the remaining course work or the instructor may indicate that the student will be required to re-enroll in the course to receive credit (in which case the /grade will not be removed). The student will sign this document or the course dean will send a copy of the document to the student's official permanent address as recorded in the Registrar's Office.
3. The student is entitled to have the Incomplete grade removed from the student's transcript only if the student completes the remaining course work as specified on the "I Grade Information Form," in a manner satisfactory to the instructor. The work must be completed within 12 months after the Incomplete is assigned and prior to the student's graduation, or within a shorter period of time if specified by the instructor on the "I Grade Information Form." If the student fails to complete the course work, the instructor may change the Incomplete grade to any appropriate grade (including D, F, or Unsatisfactory) provided that the instructor stated that this would occur on the "I Grade Information Form."
4. Incomplete grades can be removed from the student's transcript by the instructor only during the 12-month period following assignment of the Incomplete or prior to the student's graduation, whichever comes first. To remove an Incomplete, the instructor must complete a "Change of Grade Form" and file the form with the Office of the Registrar. The instructor may assign whatever grade is appropriate for the entire course. This may include grades of D, F, or Unsatisfactory. An Incomplete not changed by the assigning instructor within 12 months and prior to graduation shall remain an Incomplete grade thereafter.
5. A student may re-enroll and receive credit for any course for which an Incomplete grade was previously received, but retaking the course will not result in removal of the Incomplete grade from the student's transcript. The effect of removing an Incomplete grade on a student's academic standing (scholastic warning, probation, or suspension) depends on the date the transaction is officially recorded on the student's academic record. If the transaction is recorded before the student begins another semester, the grade replacing the Incomplete is included in the grade-point average calculation that establishes the student's academic standing. If the transaction is recorded after the student begins another semester, the new grade's effect on academic standing is based upon its inclusion with grades for the semester in which the student is enrolled. Students may appeal an unsatisfactory grade through the procedure described in the "Disciplinary Issues for Graduate Students" section of this catalog.

Independent Studies

Independent study courses (including directed reading and special topics courses which do not carry a subtitle) are for students capable of self-direction who meet the requirements for the *S/U* option, i.e., if the students are not eligible

for the *S/U* option, they are not eligible for independent study. Each college determines the maximum number of credits that may be earned in independent study courses.

Grading of Research

In grading master's and doctoral research and thesis work in progress, the instructor reports for each enrollment period the symbol PR (Progress) or U (Unsatisfactory) in place of a grade. "Progress" indicates that the student has devoted an adequate amount of time to the work scheduled but gives no indication of its quality. "Unsatisfactory" indicates that the student has stopped work or is doing work of unacceptable quality. These symbols remain on the student's transcript permanently. Only those credits graded PR (Progress) accumulate toward the minimum number of credits of research required.

After having submitted a series of PR (Progress) or U (Unsatisfactory) symbols, the instructor shall report a grade at the conclusion of the final oral examination, or no later than the date the thesis is submitted for the signature of the graduate dean. If the thesis or dissertation and the performance in the final oral examination are found to be acceptable, the instructor shall report S (Satisfactory), which grade applies to the preceding series of registrations graded Progress and Unsatisfactory and denotes the overall quality of the entire series. If the thesis or dissertation or the performance in the final oral examination is found to be unacceptable, the instructor shall report U (Unsatisfactory), which grade applies only to the credits of research for the enrollment period in which the examination is administered.

Students who accumulate a total of two Unsatisfactory grades in courses numbered 598 (approved courses), 599, 600, 699, or 700 will be placed in provisional status. Three Unsatisfactory grades in these courses will result in dismissal from the Graduate School.

Satisfactory and Unsatisfactory Course Option

Grades of Satisfactory and Unsatisfactory (S/U) may be used for courses taken by a "regular" graduate student outside the major department, provided that the student's adviser and the head of the department approve. Departments may designate three credits of departmental courses numbered 500 and above for S/U option grading with the approval of the college dean and the graduate dean. The S/U grade request form must be submitted to the graduate dean at the time of registration for an academic session.

The limitations of the S/U option are as follows: No more than six total credits of S/U courses are permitted on the master's degree. Doctoral candidates may take six additional credits under the S/U option after application to candidacy. Registration is limited to one course per semester, and courses with Unsatisfactory grades cannot be used in a student's program.

VETERANS' ATTENDANCE AND SATISFACTORY PROGRESS

See section Military/Veterans and Family Members.

POLICIES ON GRADUATE COURSES**Numbering of Courses**

Courses numbered 100 through 299 are for undergraduate credit only. In no event may courses numbered below 300 be applied toward a graduate degree; 300 through 449 courses are intended primarily for undergraduate level. In some cases, graduate credit may be obtained in courses numbered 300 through 449 with the approval of the student's adviser, the instructor of the course, the program dean, the student's department head, and the dean of the Graduate School. To secure such credit, a written request must be filed with the dean of the Graduate School at the time of registration. However, these courses cannot be deficiencies, and not more than four credits toward a degree can be granted for courses numbered below 400. The total of courses numbered 300 through 449 cannot exceed eight credits.

Courses numbered 450 through 499 are designed for seniors and graduates; 500 through 599 are primarily for graduate students working on the master's degree; 600 through 700 are principally for students working on a doctoral degree.

Adding and/or Dropping Courses

It is the student's responsibility to initiate official withdrawal from a course. Courses may not be added after the last day to add as indicated in the academic calendar (printed on the inside back cover of the Graduate Catalog or on-line at <http://gradschool.nmsu.edu/>). The last day to drop a course is listed in the Sched-

ule of Classes and the academic calendar. The refund policy and schedule is also noted in the Schedule of Classes.

Auditing Courses

A student officially admitted to the Graduate School may enroll in any class as an auditor with the verbal consent of the instructor, provided the facilities are not required for regular students. Record of enrollment is preserved but no credit is given. Courses being taken as audit will count toward total course load but cannot be used to meet the minimum course load requirements.

Because graduate students can enroll in any undergraduate course under the S/U option, they are discouraged from auditing classes.

Repeating Courses

Any graduate course numbered 450 and above may be repeated. Any computable grade (excluding I, W, AU, CR, S or U) earned for the course will be included in the cumulative grade-point average, but the credit hours may be earned only once.

Substitutions and Waivers

All substitutions or waivers of required courses for degree candidates must be approved before the last day of registration during the semester in which the student expects to obtain the degree.

Challenging Graduate Courses

A graduate student may challenge a graduate course, but the course cannot count toward an advanced degree.

Changes in Registration

Registration changes may be processed only in accordance with university regulations and with appropriate signatures. It is the responsibility of the student to initiate official withdrawal from a course.

Forms are available from the academic adviser or in the deans' offices. Courses may not be added or dropped after the deadline date indicated in the university calendar. For refund policy, see the "Costs" section of the catalog.

When a student officially drops a course, the *W* grade is assigned as follows:

- 1) No grade is assigned during the registration period.
- 2) A *W* grade is assigned to any student who officially drops a course during the first half of its duration. A student may not officially withdraw from a course after this time. All drop forms must be signed and dated by the instructor of the course and the adviser.
- 3) A grade of *W* is assigned in all courses to any student officially withdrawing from the university prior to the last three weeks of classes.

A student found insufficiently prepared to carry a regular course may be transferred to a more elementary course in the same field any day before the last day to officially withdraw from an individual course.

Any person attending under Veterans Educational Assistance should notify the Office of Veterans' Programs if dropping or adding courses changes enrollment status for benefits.

TRANSFER OF GRADUATE CREDITS INTO A DEGREE PROGRAM

A student may transfer graduate credits taken at NMSU as well as graduate credits from another university to New Mexico State University, provided the credits were earned on the campus of an accredited institution. Transferred course work (grades and hours) is maintained separately from NMSU course work.

Immediately after initial enrollment in the Graduate School, students must submit forms to obtain formal permission from the department head, the dean of the college, and the dean of the Graduate School to transfer graduate-level course work. The department has the responsibility to accept or reject any number of transferred credits based on such elements as whether the work fits into a logical program for a degree, if grades of A or B have been earned in the courses proposed for transfer, and any other elements it deems relevant. Credit granted for work done at another institution is tentative until proved by satisfactory work in residence, and the department may also require work to be validated by examination. At the master's level students must take at least 50 percent of the course work required for the degree from faculty of New Mexico State University to meet the residency requirements for their degree. Transfer credits must meet the same time-limit requirements (seven years) as graduate classes at accredited universities. Course work taken elsewhere after initiation of Graduate School at NMSU must have prior approval of the department head and the dean of the Graduate School if such work is to be transferred. All requirements as

to accreditation, level, grades, and other elements described for initial transfer work will apply.

"Request for Transfer of Credit" forms are available at Graduate Student Services.

TRANSFER OF CREDITS FOR CERTIFICATE PROGRAMS

Students enrolled in certificate programs cannot transfer credits from another institution towards the completion of the certificate program offered by New Mexico State University. However, they can transfer credits taken in a graduate certificate program of NMSU into a graduate degree program of New Mexico State University provided that the courses will lead towards a graduate degree in the focused area of the certificate program. The number of transfer credits will be determined by the program of study. The time limit on course transfer is 5 years after the completion of the certificate.

TRANSFER OF UNDERGRADUATE CREDITS TO A NMSU GRADUATE PROGRAM

A student who is enrolled in a specially designated, pre-approved (by the graduate dean and the applicable academic college dean(s) joint degree program that leads to the student being awarded both undergraduate and graduate degrees may petition to have two graduate level courses (up to six credits) previously taken for undergraduate credit considered as transfer credits into the student's graduate degree program.

To be considered for transfer credit, a course must have been taken by the student as a senior, and prior written permission must have been received from the director of the applicable graduate program, the course instructor, and the department head. In addition, only courses in which the student received a grade of B or better will be considered for transfer credit. Credit can be transferred once the student has been accepted into the graduate degree program.

Approved joint undergraduate/graduate degree programs are listed in the section called "Graduate Degree Programs."

"Request for Transfer of Credit" forms are available at Graduate Student Services and on the web page <http://prospective.nmsu.edu/graduate/current/index.html>.

LEAVING GRADUATE SCHOOL

Leave of Absence/Continuous Enrollment

Students working on advanced degrees who plan an interruption in studies for a calendar year should address a request for leave of absence through their department head, alerting the dean of the Graduate School. The student must submit a formal letter through their department head to the Dean of the Graduate School. Email will not be accepted. The request should include the beginning date and the anticipated ending date for the period of absence. A graduate student on leave of absence will be expected not to use university facilities and place no demands upon the university faculty and staff, and, therefore will pay no fees. Time spent in leave-of-absence status will not be counted toward time limits.

A graduate student who fails to register for one calendar year without obtaining a leave of absence from the Graduate School will be considered withdrawn from the university. For information on resuming studies after such absence, see "Readmission."

Withdrawal from NMSU

Withdrawal from any NMSU campus is an official procedure that must be approved as indicated on the withdrawal form. All such withdrawals will be registered on the student's transcript. It is the student's responsibility to initiate withdrawal from the university and to obtain necessary signatures. Students who leave without following the official procedure are graded appropriately by the instructor. The withdrawal process is initiated at the Registrar's Office. At all other campuses, withdrawal begins at the Student Services Office. Applicable dates are published in the university calendar for all regular sessions.

Military Withdrawal

Special provisions consistent for military personnel – see section Military/Veterans and Family Members.

Military Leave of Absence

See section Military/Veterans and Family Members.

DISCIPLINARY ISSUES FOR GRADUATE STUDENTS

Graduate Student Appeals Board.

Each academic year a standing committee, consisting of three members of the graduate faculty and two graduate students, is appointed by the dean of Graduate School to handle grievance complaints including grade appeals. Any graduate who believes that he or she has been unjustly treated within the academic process may proceed as far as necessary in the following steps to resolve his or her grievance. In general, there are three levels at which a grievance can be addressed: a course instructor or adviser, a department head, or the dean of the Graduate School. If the initial grievance is with an instructor or adviser, the process begins at Step 1. If the initial grievance is with a departmental committee, the process begins at Step 3. In all instances, the process must begin at the lowest possible level.

1. Under normal circumstances, the student should discuss the issue with the instructor/adviser.
2. If the student is unable to resolve the issue through consultation with the faculty member, the student must submit a written memorandum detailing the grievance to the course instructor or adviser within 10 calendar days of the beginning of the following full (i.e., fall or spring) semester. The person to whom the memorandum is addressed must respond in writing within 10 calendar days to the student.
3. If the student is not satisfied with the response from Steps 1-2, he or she must submit a written appeal to the department head within ten working days of the initial decision. If the student is initiating the appeal at the departmental level, he or she must do so, in writing, within 10 calendar days of the beginning of the following full (i.e., fall or spring) semester. The department head must respond in writing within ten working days to the student, the instructor or adviser (if one is involved), and the dean of Graduate School.
4. If after the third step the student or any of the other parties involved is still not satisfied with the response, he or she must present to the dean of the Graduate School within ten working days a formal letter that provides specific details regarding the nature of the grievance. In the letter, the student can request that their case be presented to the Graduate Student Appeals Board. After receiving a letter complaint (not an email), the dean of the Graduate School will determine whether the complaint has merit. If the graduate dean determines that the appeal does not have merit, he or she will inform the appellant and other parties, in writing, within ten working days of receiving the appeal. Please note that additional days may be required to collect information from the faculty and/or student involved in the case. If the graduate dean decides that the appeal does have merit, he or she will convene the Graduate Student Appeals Board, normally within three weeks. The Graduate Student Appeals Board will conduct, within 60 days of their convening, whatever investigations and deliberations are necessary, and will forward to the dean of the Graduate School a recommendation to resolve the grievance.
5. After reviewing the recommendation of the Graduate Student Appeals Board, the dean of Graduate School will, within ten working days, inform all parties involved of his or her decision in writing. The decision of the dean of the Graduate School is final.

The dean of the Graduate School may waive the normal time frame for grievances when either party presents compelling evidence justifying such a delay, but grievances must be launched within one year.

Grade appeals involving charges of plagiarism must follow the process established on academic misconduct in the Student Code of Conduct. The web-site is <http://www.nmsu.edu/~vpsa/SCOC/index.html> Graduate School strongly encourages students to study and use the Plagiarism web site of the Library to learn of ways to avoid plagiarism: <http://lib.nmsu.edu/plagiarism>.

Academic Probation and Suspension

Academic records of all graduate students are reviewed at the end of each semester. A student whose cumulative grade-point average at the end of any semester is less than 3.0 will be so informed and will be placed on probation. If, during the next enrollment period, a student fails to achieve a cumulative grade point average of 3.0 or to show substantial improvement in the quality of work (as determined by the graduate dean in consultation with the student's primary department), the student will be suspended for one semester from the Graduate School. Students on suspension are barred from enrolling in graduate level courses at NMSU. Students on suspension who wish to continue Graduate

School after suspension must re-apply to the Graduate School and the department of interest. Subsequent suspensions will be for one calendar year and the student must petition the graduate dean for re-admission. No NMSU graduate level course credit will be granted for courses taken at NMSU or other institutions while under suspension from NMSU.

The Graduate School provides workshops on ways to succeed in graduate studies. All students are encouraged to take advantage of these workshops which can be found on our web site, <http://gradschool.nmsu.edu/workshops>.

Disciplinary Probation and Suspension

Graduate students are subject to the rules and regulations with respect to disciplinary probation and suspension as listed in the "Student Code of Conduct" section of the Student Handbook <http://www.nmsu.edu/~vpsa/SCOC/index.html> and in the "Regulations" section of the Undergraduate Catalog http://www.nmsu.edu/Academic_Progs/Undergraduate_Catalog/. Graduate students who engage in academic misconduct at any of the other campuses of New Mexico State University, including Alamogordo, Carlsbad, Dona Ana and Grants, are also subject to the Student Code of Conduct of NMSU.

Attendance and Student Behavior

The instructor may report any absences to the graduate dean when the number of absences from class (including audited courses) is impairing the work of a student in a course. The graduate dean may drop a student from a class for persistent absence when such action is recommended by the instructor. Similarly, a student may also be dropped from a class for engaging in behavior that interferes with the educational environment of the class.

Students making satisfactory progress in their classes will be excused from classes when they are representing New Mexico State University on a university-sponsored event (e.g., ASNMSU president representing NMSU at legislative session, student-athletes competing in NMSU-scheduled athletic events, or students attending educational field trips and conferences).

Authorized absences do not relieve the students of their class responsibilities. Prior written notice of the authorized absence will be provided to the instructor by the sponsoring department.

Only students who have enrolled in a class for credit or audit are allowed to attend classes. A student who has officially withdrawn from a course may continue to attend the course with the permission of the instructor for the remainder of the semester.

Students not enrolled may visit classes only with the permission of the instructor.

Academic Conduct of Graduate Students

Graduate students at New Mexico State University are expected to observe and maintain the highest academic, ethical, and professional standards of conduct.

Students should consult Section III of the "Student Code of Conduct" in the Student Handbook <http://www.nmsu.edu/~vpsa/SCOC/index.html> for more specific information regarding the rules of conduct and definitions of misconduct. In the event these standards of conduct appear to have been breached by violations such as plagiarism (consult the Library's Web page at <http://lib.nmsu.edu/plagiarism>, cheating, nondisclosure or misrepresentation of academic credentials, fabrication of data, or other forms of academic misconduct, the procedures set forth below shall be employed to resolve the issues. As mentioned prior, graduate students who engage in academic misconduct at any of the other campuses of New Mexico State University, including Alamogordo, Carlsbad, Dona Ana and Grants, are also subject to the Student Code of Conduct of NMSU.

Procedures to Deal with Cases of Alleged Academic Misconduct in Graduate School

Policies and procedures for dealing with such cases are detailed in the in the Student Code of Conduct <http://www.nmsu.edu/~vpsa/SCOC/index.html>.

Questions concerning these policies and procedures should be addressed to the dean of the Graduate School. Procedures include all course levels and all of the campuses of New Mexico State University, including Alamogordo, Carlsbad, Dona Ana, Grants and Las Cruces

PRIVACY ISSUES

Privacy rights

The following information has been designated as directory information and is subject to release to the public under the Buckley Amendment (PL 98-

380), "The Family Educational Rights and Privacy Act of 1974": Student's name, address, e-mail address, telephone listing, date and place of birth, major field of study, classification, participation in officially recognized activities and sports, weight and height of members of athletic teams, dates of attendance, degrees and awards received, and the most recent, previous educational agency or institution attended by the student.

Other information regarding disclosure of student data is posted at the Office of the Registrar in compliance with the act. Requests for withholding directory information must be filed in writing with the Office of the Registrar.

PURGING OF STUDENT FILES

All files of students who have attended NMSU Graduate School are kept for five years following final enrollment and then destroyed. Only archival documentation is retained. The files of students who do not enroll are destroyed after one year.

TRANSCRIPT OF CREDITS

A charge of \$5 is made for any official transcript of credits. No transcript of credits will be released if the student is in debt to the university.

Official name changes on transcripts will be processed upon written request to the Office of the Registrar and only if a student is currently enrolled.

CHANGE OF ADDRESS

In order to assure accurate student records, **students are responsible for keeping Graduate Student Services and the Office of the Registrar informed of the following:** Changes in residence and mailing addresses; current telephone numbers, and primary e-mail addresses. Failure to do so may result in transcripts, diplomas, or other important communications from the university not being received in a timely manner.

EVALUATING YOUR ACADEMIC EXPERIENCE

As part of its continuing effort to maintain quality academic programs and to provide strong support services, New Mexico State University routinely conducts surveys. Students may be required to participate in one or more of these activities. The resulting data will be published only in aggregate form.

REQUIREMENTS FOR ENROLLED STUDENTS

The following are general requirements applying to all graduate students. Requirements applicable to specific graduate degrees follow this section.

FULL-TIME GRADUATE STUDENT

A full-time graduate student is one enrolled for nine or more credits per semester, other than for tuition purposes. Students doing graduate work while engaged in full-time, off-campus employment should limit themselves to one or two courses per semester.

Graduate students should take into consideration any outside workload and commitments in planning their course load. Full-time graduate students without other commitments normally enroll for nine to 12 graded credits each regular semester; the maximum number of graded credits a graduate student may take in any regular semester is 15. During a ten week summer session, the maximum number of graded credits a graduate student may take is 9. Graduate students may enroll in a five week session and a ten week session concurrently as long as the total number of graded credits for both sessions does not exceed 9. Graduate students may enroll for one additional credit that is not graded (i.e., Audit) for summer, fall, and spring semesters.

COURSE DEFICIENCIES

Students who have been admitted with departmental deficiencies may be required to take diagnostic tests and additional qualifying examinations. They must complete satisfactorily, in a manner specified by the major department, all undergraduate course deficiencies as prescribed by the department responsible for the graduate program. Course deficiencies will be listed on the transcript; however, these deficiencies will not be calculated in the student's graduate GPA or graduate hours.

With the permission of the student's adviser and the head of the department, courses to meet undergraduate deficiencies may be taken under an S/U option (with S being a grade satisfactory to the professor). These courses will not affect the maximum number of S/U graduate credits permitted.

SPECIALIZATIONS/CONCENTRATIONS

A specialization is a collection of coursework in a specific area that is part of a degree program of study at NMSU. Only approved specializations/concentrations within a students' department or program may be noted on a transcript.

Students must file a request for inclusion of an approved specializations/concentration at the time they file their program of study and must identify the specializations/concentration in their application for the degree. Specializations/concentrations will not be added to a transcript after the degree is awarded.

Departments must certify that a student has met the requirements for a specializations/concentration at the time the student successfully completes the final examination.

DECLARATION OF MINOR

Any doctoral applicant for candidacy may declare up to two approved minors in addition to the major area of study. All minors must be approved by the minor department head and the dean of the Graduate School and normally consist of nine credits. Demonstration of competency in the minor area will be required at both comprehensive and final examinations.

COMPLETING A THESIS OR DISSERTATION

The student must ensure that each member of the examining committee receives a copy of the thesis no later than seven working days before the date of the final examination.

The form and style of the thesis or dissertation must comply with the regulations given in the [Guidelines for Preparing a Thesis or Dissertation](#). These guidelines also contain detailed information on the thesis-approval process and binding. See <http://gradschool.nmsu.edu/Guidelines>. Candidates are encouraged to consult with the graduate reviewer on format, deadlines, and procedures before final typing.

The thesis must be submitted to the graduate reviewer on or before the deadlines posted in the current academic calendar printed inside the back cover of the current [Graduate Catalog](#) and at <http://gradschool.nmsu.edu/deadlines/deadlines.htm>. The thesis or dissertation is not complete until copies have been accepted for binding by the binding section staff in Branson Library.

OUTCOMES ASSESSMENT - Evaluating Your Academic Experience

New Mexico State University is committed to providing its students with a quality education and a supportive learning environment. Assessment is a process of rigorous review followed by implementation of changes to enhance and improve the quality of education students receive at NMSU. For assessment to be effective, students must be actively aware of, and engaged in, assessment activities. Faculty and staff at NMSU will communicate to students the value and implications of assessment. For their part, students will provide feedback on personal, professional and academic development. Students are expected to participate in all types of assessment when asked to do so. Types of assessment activities include class assignments, course projects, exams, exit interviews, standardized tests, surveys, focus groups, etc. Data gathered through these assessments will be published only in aggregate form. Efforts will be made to inform students of assessment results and the program improvements implemented as a result of assessment.

REGISTRATION FOR SUMMER GRADUATION

If the final examination is to be scheduled or the thesis is to be completed during the summer, the student must register for one credit hour during the summer session in which the oral examination will be held or the thesis will be completed.

In order to graduate during a summer session the student must also have filed the "Application for Degree (Diploma)" by the deadline posted in the current Schedule of Classes, or the academic calendar printed on the inside back cover of the current Graduate Catalog, and at <http://gradschool.nmsu.edu/deadlines/deadlines.htm>.

APPLICATION FOR DEGREE (DIPLOMA)

The student must file an "Application for Degree (Diploma)" by the deadline set forth in the Schedule of Classes. The student must submit the "Application for Degree (Diploma)" to the Office of the Registrar prior to the last day for registration for the final semester or summer session in which the student will be completing degree requirements.

Students filing an "Application for Degree (Diploma)" after the deadline will be charged an additional \$25 fee. No "Application for Degree (Diploma)" forms are processed after midterm. The Graduate School will not approve Applications for Degrees after the late fee deadline has been reached.

If a student does not complete requirements for the semester for which the "Application for Degree (Diploma)" has been made, **then the student must reapply for the degree and pay all applicable fees for the semester in which the degree requirements will be completed.**

ATTENDANCE AT COMMENCEMENT

To participate in commencement, all eligible candidates must have applied for their degree by the deadline established by the Registrar's Office (<http://nmsu.edu/~registra/degdate.html>) and met all final degree requirements set by their department, the Graduate School and Graduate Student Services. In addition, doctoral degree students who wish to participate in commencement must have applied for their degree by the deadline established by the Registrar's Office, submitted their dissertation title by the deadline set by the Graduate School and met all final degree requirements. The title of the dissertation will be published in the Commencement book provided that all requirements and deadlines were met by the student. Degree recipients from the previous summer session who wish to participate in commencement must attend the fall ceremony. Students who complete all degree requirements in the spring semester attend the spring ceremony.

Participation in commencement does not, in itself, mean that a student is considered an NMSU graduate. In order to receive a graduate degree, a student must fulfill all university requirements. The degree will reflect the graduation date when all requirements were met.

THE MASTER'S DEGREE

New Mexico State University offers both academic and professional master's degrees.

If the student's undergraduate program fails to provide a proper foundation for advanced work in the chosen field or department, the student may be required to take classes to correct those deficiencies, consequently resulting in a longer period of residence than would otherwise be required.

AMOUNT AND DISTRIBUTION OF WORK

A minimum of 30 semester credits is required for the master's degree. Most master's degrees require at least 15 credits in courses numbered 500 or above, including thesis credit for master's programs involving a thesis. Master's programs involving a thesis include no more than six and no fewer than four credits of thesis. (See the section on "Thesis" for further guidelines.)

At least 15 credits for the master's degree must be for work in courses in the department in which the student was admitted. Additional credits may be selected from other fields to fit into a logical, justifiable program. Courses used to remove deficiencies or satisfy prerequisites cannot be counted as part of the requirements for the master's degree.

Students must take coursework from a variety of faculty. Students may not take more than half of the minimum credits required for a master's degree (excluding thesis credits) with the same professor. Short courses of less than one summer session or one semester duration cannot constitute more than one-fourth of the total course requirements for a master's degree.

PROGRAM OF STUDY

It is recommended that, during the first semester of enrollment, each graduate student beginning studies toward a degree prepare a complete tentative program of study in consultation with the student's adviser. This tentative program should be kept in the student's file within the department and is not to be considered as the "Application for Admission to Candidacy," which contains the permanent program.

APPLICATION TO CANDIDACY

The admission of a student to the Graduate School does not imply admission to candidacy for an advanced degree. The major department in which the student intends to become a candidate for a master's degree must be satisfied as to the student's sound basic training and the ability to pursue studies at the graduate level. Departments may require a comprehensive qualifying examination before officially approving any candidate for the master's degree.

An "Application for Admission to Candidacy," which formally lists curriculum requirements for the student's program of studies, must be filed with Graduate Student Services no later than after the completion of 12 credits of graduate work.

At the time the "Application for Admission to Candidacy" is submitted, the student must have a cumulative graduate grade-point average of 3.0. The application may specify the Graduate Catalog in effect at the time of matriculation, provided that the catalog is not more than seven years old. Otherwise, the current Graduate Catalog will be used. The student's program listed in the "Application for Admission to Candidacy" must (1) meet the requirements of the chosen catalog, including the regulations of the Graduate School and of the major department, (2) include undergraduate deficiencies and required courses specified on the student's "Certificate of Admission," (3) be certified by the student, the student's adviser, heads of departments offering major and minor fields, and the cognizant deans, and (4) list each course number and abbreviated title with the hours and grades. If the program is not satisfactory in the judgment of the graduate dean, it may be returned to the department for revision. When the "Application for Admission to Candidacy" has been approved by the graduate dean, the student will be formally admitted to candidacy for the master's degree.

THESIS OR NON-THESIS OPTION

A thesis in the major field is recommended and may be required, at the discretion of the department concerned.

Not more than six nor fewer than four thesis credits may be counted toward the requirements for a master's degree.

Many departments have a non-thesis option. Please check with the department on the non-thesis option.

CONTINUOUS ENROLLMENT

Having once registered for thesis, a student must continue to register for a minimum of one credit in thesis or graduate course work each regular semester until the thesis is approved by the Graduate School and the copies have been accepted by the binding section in Branson Library. A student who fails to abide by this regulation will be considered withdrawn from the university and, in order to resume studies, must formally apply for readmission and satisfy the requirements in effect at the time of reapplication.

GRADUATE COMMITTEE

The master's degree committee will consist of a minimum of three faculty members holding at least master's degrees. The committee chair and one other member must be in the student's department; however, the home department of one of these two committee members may be outside the student's department (see Graduate Faculty Guidelines section "Appointments Outside of Home Department"). The third person on the committee must serve as the dean's representative and cannot be a faculty member of the students' home department.

The committee chair and the dean's representative must be members of the graduate faculty (please refer to "Guidelines for Graduate Faculty Appointments"). If the student has an approved minor area of study then either the dean's representative or a fourth committee member must come from the minor department.

If no minor is declared, the dean's representative may come from a related area (recommended by the committee chair) or be appointed independently by the dean of the Graduate School.

All students completing a written exam are required to have a dean's representative that reviews the process of administering the exam. The dean's representative that reviews the process can sign off on all of the exams of students taking a written exam for the given semester. The dean's representative must be from outside the students' home department.

The faculty committee of the student is responsible for identifying a dean's representative and completing the examination forms. A list of graduate faculty is available at the web site of the Graduate School. Faculty can use the list to identify graduate faculty to serve as the dean's representative.

Departments can nominate individuals with a master's degree and/or doctoral degree and related experience for a temporary appointment to graduate faculty (Please see Appointment to Graduate Faculty of Non-NMSU Employees in the Guidelines on Graduate Faculty Appointments in this Graduate Catalog). Nomination letters must identify specific roles of the individual and the year(s) of service (up to three years per request per individual). The nomination letter must receive the endorsement of the academic dean. If granted a temporary appointment to graduate faculty, the individual will be limited to the specific role(s) identified by the department. Departments can request that the individual be allowed to serve as a dean's representative.

As indicated in the "Guidelines for Graduate Faculty Appointments," any qualified member of the graduate faculty may join any graduate program within a department. Applicants will be approved by the graduate program to which they are applying, through a process to be determined by that program, before their application is forwarded to the dean of the Graduate School. Departments may structure committees that include more than the minimum number of members as long as the stated conditions of membership are satisfied. Additional voting and nonvoting members may be any person approved or appointed by the dean of the Graduate School.

FINAL EXAMINATION

Candidates take a final examination in accordance with the schedule provided by the Graduate Student Services. **It is the student's responsibility to be sure that the form to schedule this examination is submitted to the Graduate School at least ten working days prior to the proposed date for the examination.** Each candidate will be given a final examination conducted by the graduate committee.

At the time of the final examination, a graduate student must have an NMSU cumulative graduate grade-point average of at least 3.0 and must be enrolled in the final semester; or, if the student is writing a thesis, he or she must have completed all course work for the master's degree.

Students with the nonthesis option may be required to pay a special exam fee in lieu of registering for one credit hour of graduate course work. (See "Tuition, Fees, and Other Expenses.")

The final examination format shall be determined by the department, with the approval of the graduate dean. If a department does not specify an examination format, the final examination shall be in part an oral defense of the thesis, if a thesis has been written, and in part a general examination of the candidate's field of study.

Any candidate who fails in the final examination may (1) upon recommendation of the adviser and approval of the graduate dean, be granted a second examination after a lapse of at least one semester, or (2) be excluded from further candidacy for the degree. Failure in the second examination disqualifies a candidate from obtaining the degree. Certification that the thesis has been accepted and that the final examination has been passed must be filed with Graduate Student Services not later than one week before the degree is conferred.

TIME LIMIT

The graduate program leading to the master's degree must be completed within seven years (or eight successive summers) including completion of the master's thesis or final project. Any course work more than seven years old at time of the final examination will not be included in the program.

MINORS

A candidate for a master's degree may select up to two approved minors in addition to the major. A minimum of nine credits of graduate work is necessary for a minor at the master's level. (See "Graduate Degree Programs, Specializations/ Concentrations, and Approved Minors" for a list of approved minors.) To record a minor on a student's permanent record, the minor must be listed on the "Application for Admission to Candidacy" and this form must be signed by the head of the department offering the minor program. At the oral examination, a committee member may move to remove the designation of a minor with the concurrence of the committee.

A minor will not be awarded after the degree has been posted to the transcript.

INTERDISCIPLINARY MASTER'S DEGREE

Interdisciplinary studies at New Mexico State University are intended for individuals specializing in programs that require the integration of more than one discipline to fully engage in the field of study. Interdisciplinary studies provide a mechanism to address emerging scholarship, innovation, and research. Interdisciplinary studies allow graduate students to engage in emerging technologies, optimizing their education outside the traditional disciplinary boundaries. Interdisciplinary study takes advantage of traditional academic training within specific departments yet allows students to customize their own career preparation.

In these programs, a coherent common core is expected and is intended to combine existing courses across disciplines to meet unique objectives. The Master of Science or Master of Arts degrees are awarded for interdisciplinary programs and are carried out under the direction of the student's graduate committee. The interdisciplinary studies option should not be used in cases where the applicants' objectives can be realized by admission to a specific department and inclusion of up to two minor areas in the program of study.

Admission

Students follow the regular admission procedures set forth by the Graduate School. In completing the application the applicant indicates IMAS in the section requesting Department or Program and designates the area of interdisciplinary study in the section requesting "Field or area of advanced study." A proposal for interdisciplinary studies (see 1 below) must be submitted with the application. A departmental referral form will be generated and sent to the primary department specified in the proposal (see 3 below). Once the student's graduate committee is designated the committee can require additional materials such as a statement of interest, letters of recommendation, GRE or GMAT scores, and a personal interview.

Thesis/Non-thesis option

As with any graduate student, the student in interdisciplinary studies can select to follow a thesis or non-thesis option. Students enrolled in the thesis option register for six thesis credits. Students not wishing to follow the thesis option will be required to complete a project report. The project must reflect the interdisciplinary nature of the program in which the student is engaged.

Comprehensive exam

Students in interdisciplinary studies take a comprehensive exam composed of questions designed by the student's committee. Two individuals in the areas of study plus the dean's representative outside of the department/program/interdisciplinary study option will be involved. A chair is also identified.

Degree awarded

Students receive a Master of Arts (MA) or Master of Science (MS) and a concentration in the interdisciplinary study area.

Other conditions that apply

1. The student must present a written description of the program concept consisting of (a) objective of the program of study including proposed areas of skill development, proposed courses in more than one graduate degree granting department of NMSU, and (b) a justification for not using an existing departmental degree program. In addition the student needs to designate the degree being sought (Master of Science or Master of Arts) and a name for the interdisciplinary area.
2. The student's program of study must include a minimum of 30 graduate level credits and a maximum of 36 credits. The student may take six credits in departments that do not grant a graduate degree but the courses must be numbered 450 and above, and be pertinent to the program of study.
3. The majority of the departments involved in the student's program will be master's degree and doctoral degree granting departments. The student is expected to take at least 15 credits in the primary area of study within one department. The department selected by the student will receive a copy of the student's application for admissions to the Graduate School of NMSU. In addition, the student is required to select an approved minor area of study in another department that consists of at least 9 credit hours (see the Graduate Catalog for the approved list of minors).
4. The student will form a committee composed of members of the graduate faculty and select an advisor who will chair the committee. The chair must be from the primary department where the student has taken at least 15 credit hours listed in the proposal submitted and the other com-

mittee member must be from another department in which the student has selected a minor area of study from the approved list of minors listed in the Graduate Catalog. The third faculty member must be the dean's representative.

5. The student will be required to submit the Candidacy Form after 12 credits are satisfactorily completed.
6. The program will meet all requirements of a master's degree, as listed in the Graduate Catalog; with the interpretation that "major field" includes courses from two or more departments and in the designated interdisciplinary study area.
7. The program of study will include completion of a research thesis or project. The work may be submitted in the form of a publishable manuscript, technical report, thesis or creative option.
8. The student may enroll on a part-time basis keeping in mind that coursework cannot be more than seven years old at the time of the final examination.
9. The student will be administered a final comprehensive exam that is consistent with the department selected for the primary area of study. For example, if a department requires a written exam, the student in the interdisciplinary masters will also be required to take a written exam.
10. The final oral comprehensive exam will consist of questions pertinent to the area of study and the defense of the research thesis or project. In both cases an integrated approach to the areas of study chosen should be followed.
11. All other rules for graduate study at NMSU must be followed.

SECOND MASTER'S DEGREE

A student who has earned one master's degree at NMSU may be allowed to count a maximum of six semester credits earned on the first degree toward a second master's degree, if those credits fit into a logical graduate program. The number of shared credits may be increased for dual and joint degree programs.

DUAL AND JOINT DEGREE PROGRAMS

A dual degree program is a program of study whereby courses of study are combined so that students can complete two degree programs of study in less time than it would take if the programs were independently pursued. Upon graduation, they receive two separate diplomas from each degree program of participating departments and/or institutions. To enroll in a dual, students must complete two separate applications, receive two independent offers of admissions, and meet program and course requirements of both programs of study.

A joint degree program is one where two or more departments interweave their courses and course requirements to create a single degree program. Students are admitted into one program, take courses in each participating department, college or university, but only received one degree and diploma. These degree programs allow departments and/or campuses to take advantage of faculty talents.

Both dual and joint degree programs must have prior approval by the Graduate School. Students must apply and be accepted into graduate programs of each department participating in a specific dual or joint degree program. The list of approved dual and joint degrees can be found in the section "Graduate Degree Programs."

TEACHER LICENSURE

Students wishing to take graduate courses for licensure or renewal of licensure or for personal enrichment must be fully admitted to a department to do so. Undeclared students may not register for teacher licensure classes. Endorsement is available at both the elementary and secondary levels in bilingual education, TESOL (Teaching of English as a Second Language), reading, and special education. Endorsement is also available in early childhood education at the elementary level. Contact curric-instr@nmsu.edu for more information.

SPECIALIST IN EDUCATION DEGREE

The degree of specialist in education is provided for experienced members of the education profession who have completed the master's degree (except the school psychology program, which requires the bachelor's degree) and have maintained a 3.3 grade-point average during pursuit of this degree or its equivalent. Primary emphasis is placed on the development of competencies needed for a professional specialization in a given field. Programs are available in curriculum and instruction and school psychology.

Students must complete the general application for the Graduate School. They should also check with the admitting department for specific departmental requirements.

Residency and Credit Requirements

The specialist in education degree requires a minimum of 30 semester credits beyond the master's degree, including research, intern experiences, and graduate courses. The student meets the campus residency requirement by completing a minimum of 24 credits from faculty of New Mexico State University.

The student must maintain a 3.0 average. No more than six semester credits of C level work are allowed in this program.

Program of Study

It is recommended that, during the first semester of enrollment, each graduate student beginning studies toward a degree prepare a complete tentative program of study in consultation with the student's adviser. This tentative program should be kept in the student's file within the department and is not to be considered as the "Application for Admission to Candidacy," which contains the permanent program.

Transfer of Credits

A maximum of six graduate credits earned at another approved institution may apply to this degree. Transfer credits must have been earned during the five-year period prior to completion of the specialist in education degree.

Major Field

All course work taken for the degree should apply directly, through a logical program of study, to the specialty which the candidate has selected. Two to six credits will be earned through research that is acceptable to the College of Education and the cooperating educational agency. Each department is responsible for defining the required sequence of courses.

Candidacy

Following the successful completion of 12 semester credits beyond the master's degree, the student is eligible for admission to candidacy. With the achievement of candidacy, a committee is appointed to work with the candidate on the remainder of the program. The committee consists of three members of the graduate faculty in the College of Education.

Internship

Each candidate will earn from three to six semester credits in an internship. This experience will consist of supervised performance of duties related to the candidate's specialty. The structure of the internship will be determined by the student's department. A research project will be conducted in conjunction with the internship.

Oral Examination

The oral examination committee will consist of the student's committee plus a dean's representative appointed from the graduate faculty by the dean of the Graduate School. This committee will conduct an oral examination at the conclusion of the research project and no earlier than the candidate's last semester of enrollment.

The examination will consist of a defense of the project along with general questions on subject matter related to the candidate's field of study. Any candidate who fails the oral examination may, upon recommendation of the adviser and approval of the graduate dean, be granted a second examination after a lapse of at least one semester. Failure in the second examination disqualifies the candidate from obtaining the degree.

Time Limit

The specialist in education degree must be completed within seven years following admission to the program.

Students cannot include any course work on their program of study that is more than seven years old at the time of the final oral examination.

THE DOCTORAL DEGREES

PREPARATION FOR DOCTORAL DEGREE PROGRAMS

Prospective candidates are expected to hold bachelor's or master's degrees from accredited institutions, based on curricula that include the prerequisites for graduate study in the department of their subject. To be considered for admission to a doctoral program, the applicant must have a grade-point average of at least 3.0. Prospective candidates are urged to consult the department in which they wish to study for information concerning specific requirements.

DOCTOR OF PHILOSOPHY (Ph.D.)

The degree of doctor of philosophy requires distinguished attainment in both scholarship and original research. The degree is granted chiefly in recognition of the candidate's high attainments and ability in the special field, as shown by work on the required examinations covering both the general and the special fields, and by the preparation of a dissertation. A candidate for the Ph.D. degree is expected to maintain a higher level of work than the grade-point average of 3.0 that has been established for the candidate for the master's degree.

DOCTOR OF EDUCATION (Ed.D.)

The degree of doctor of education attests proficiency in a program of graduate study in which the emphasis is upon preparation for competent performance in professional education. This program is intended primarily for students pursuing careers in which teaching, administration, or school services predominate, rather than those in which research predominates. The Ed.D. degree in curriculum and instruction is offered in the Department of Curriculum and Instruction; the degree in educational administration is offered in the Department of Educational Management and Development.

The requirements for doctoral degrees in the two departments of the College of Education have the following distinguishing elements:

1. The qualifying examination consists of a written and an oral section, both of which are administered prior to admission to the program. Successful completion of the qualifying examination is tantamount to acceptance of the student for doctoral admission. Residency of at least two consecutive semesters cannot commence until the semester after the qualifying examination is successfully completed.
2. Comprehensive examinations are usually administered three times annually. The written examination tests the major and related areas of concentration. Within two weeks after successful completion of the major and related area examinations, the student takes a comprehensive oral examination. Candidacy follows the successful completion of the orals. A student who fails any part of the comprehensive examination may present him- or herself for re-examination of the failed part of the exam before moving on to the next part.
3. The major area of study must be within the College of Education. A minimum of nine planned and integrated credits constitutes the related area and can be taken in any department of the university with the approval of the student's committee. The related area must be specifically planned with the major and minor departments in order for the doctoral fields to be mutually supportive. Any transfer credit or predoctoral course work to be included in the related field must have the approval of both the major and minor department at the outset. Specified course work in both research and statistics is required for this degree. Other requirements are described in the departmental sections of this catalog.

DOCTOR OF ECONOMIC DEVELOPMENT

Students enrolled in the Doctor of Economic Development are required to complete and pass all required course work for their degree program. They are also expected to complete and pass their comprehensive examination. Since a dissertation is not required, they are expected to complete an internship experience and a Project paper as defined by their program. They can embark on the Project paper once they have completed and passed their comprehensive examination. They are not required to take 700 level dissertation hours. However, they are expected to complete at least 12 credits at the 600 level including ECDV 694 Internship and ECDV 699 Doctoral Project.

A Project paper must be finalized using a similar submission process as the dissertation (see section Finalizing the Doctoral Dissertation of the Graduate Catalog). On the front page, after the title of the paper, the student should indi-

cate that it is a Project paper. Students completing Projects papers do not need to complete the Earned Doctoral Survey. The paper must be submitted to the Graduate School for format review on or before the deadline. The form and style of the paper must comply with regulations given in the Guidelines for Preparing a Thesis or Dissertation. These guidelines also contain detailed information on the dissertation/project paper-approval process as well as information on binding. Candidates are encouraged to consult with the graduate editor on format, deadlines, and procedures before final typing. The project paper is not complete until copies have been accepted for binding section staff of Branson Library and until the microfilm agreement form has been completed and received in Branson Library.

DOCTOR OF NURSING PRACTICE

Students that hold a baccalaureate degree in Nursing are required to complete and pass all required course work for the Doctor of Nursing Practice degree program. They are also expected to complete and pass their comprehensive examination. Since a dissertation is not required, they are expected to complete an internship experience and a project paper as defined by their program. They can embark on the Project paper once they have completed and passed their comprehensive examination. They are not required to take 700 level dissertation hours. However, they are expected to complete at least 12 credits at the 600 level including NURS 698 Advanced Clinical Residency and NURS 699 Clinical Scholarly Project. Students that hold a Master's of Science in Nursing are required to complete all course work requirements, complete and pass their comprehensive exam, and complete a Project paper. To complete their Project paper, they must complete at least 6 credits at the 600 level including NURS 699 Clinical Scholarly Project.

A Projects paper must be finalized using a similar submission process as the dissertation (see section Finalizing the Doctoral Dissertation of the Graduate Catalog). On the front page, after the title of the paper, the student should indicate that it is a Project paper. Students completing Project papers do not need to complete the Earned Doctoral Survey. The Project paper must be submitted to the Graduate School for format review on or before the deadline. The form and style of the paper must comply with the regulations given in the Guidelines for Preparing a Thesis or Dissertation. These guidelines also contain detailed information on the dissertation/ project paper-approval process as well as information on binding. Candidates are encouraged to consult with the graduate editor on format, deadlines, and procedures before final typing. The project paper is not complete until copies have been accepted for binding section staff of Branson Library and until the microfilm agreement form has been completed and received in Branson Library.

INTERDISCIPLINARY DOCTORATE

Students wishing to study in the interdisciplinary doctoral degree program must apply and be accepted into a doctorate-granting department. The following requirements for admission to the interdisciplinary doctorate degree program have been established:

1. A master's degree or equivalent program of study that includes at least 30 credit hours of graduate course work with a minimum cumulative grade point average of 3.0.
2. Twelve credit hours of graduate course work completed at New Mexico State University.
3. Evidence of outstanding academic achievement in graduate school.
4. A written description of the program concept prepared by the student consisting of (a) areas in which competency is required; (b) proposed readings and course work and how these relate to required competencies; (c) objectives and an outline for thesis research; (d) justification for not using an existing departmental degree program.
5. The student must select an adviser from his or her department to chair the committee and, in consultation with the adviser, structure a committee consisting of at least five faculty members from the graduate faculty list who are willing to work on the interdisciplinary degree program. The committee must include at least two members from each of two doctorate-granting departments. The committee chair will convene a meeting to review and approve the proposed program.
6. Graduate Student Services will send an "Admission Referral" document, signed by all committee members, to the heads of all departments from which the student proposes to use more than eight credits of course work, or from which faculty are requested to serve on the proposed committee.

7. Once the "Admission Referral" document has been approved by all departments, the committee chair will convene a meeting of the committee to review the student's program and make changes as necessary. In addition, the committee will set the format and date for the qualifying exam. An effort should be made to incorporate the interdisciplinary nature of the program into the qualifying exam.
8. When the student has passed the qualifying exam and the "Admission Referral" memorandum has been approved by the respective department heads, the requirements for admission to the program are satisfied. Formal acceptance into a doctoral program may be required in order to receive financial assistance.
9. The dissertation work shall total at least 18 credits of a 700-level course.

REQUIREMENTS FOR THE DOCTORAL DEGREES

Qualifying Examination

Doctoral students must pass a qualifying examination. This examination is scheduled by the student's adviser and is administered by the major department. Its purpose is to determine the areas in which the student shows strength or weakness, as well as the ability to assimilate subject matter presented at the graduate level.

Scheduling the qualifying examination is based on the following criteria: (a) for students who enter the Graduate School with little or no previous graduate experience but wish to proceed directly to the doctorate, the qualifying examination should be taken after 12 credits of graduate work; (b) for students who enter with a master's degree or equivalent from another university, or another department, the qualifying examination should be taken before the completion of one semester of graduate work.

The department may allow the master's final examination to serve as the doctoral qualifying examination or may require a separate examination for students who earn their master's degree at New Mexico State University, and will continue in the same department.

Based on the result of the qualifying examination, the department will take one or more of the following actions: (a) admit the student to further work toward the doctorate; (b) recommend that the program be limited to the master's degree; (c) recommend a re-evaluation of the student's progress after the lapse of one semester; or (d) recommend a discontinuation of graduate work. In all cases, Graduate Student Services shall be notified of the results of the qualifying examination.

Upon passing the qualifying examination the student will be admitted to the doctoral program. The student's adviser and department head will then appoint the doctoral committee to prepare the student's preliminary program of study for the doctorate. This program shall be filed with Graduate Student Services.

Graduate Committee—Doctoral

The doctoral committee will be composed of at least four members of the graduate faculty holding doctoral degrees. The following rules apply to the composition of the committee:

- In addition to the committee chair, at least one other member must be from a discipline within the student's major area, which may encompass more than one degree-granting department.
- One member of the committee may be from a related area of study other than the student's declared minor.
- If an approved minor is declared, at least one but not more than two members of the committee must be from the minor area.
- At least three committee members must be members of the graduate faculty in doctorate-granting departments. Of these three members:
- The committee chair must be a member of the graduate faculty in the student's department (See the section "Appointments Outside of Home Department" in the "Guidelines on Graduate Faculty Appointments").
- The home department of no more than one of the other two committee members from doctorate-granting departments may be outside the student's department.

As indicated in the "Guidelines for Graduate Faculty Appointments," any qualified member of the graduate faculty may join any graduate program within a department. Applicants will be approved by the graduate program to which they are applying, through a process to be determined by that program, before their application is forwarded to the dean of the Graduate School.

One member of the committee must serve as the dean's representative. The dean's representative can be either the member from the related area or

minor area or an independent member appointed by the dean of the Graduate School but must not be from the student's department. In programs where more than one department is a participant, the dean's representative may not be from any of those departments.

Departments may structure committees that include more than the minimum number of members as long as the stated conditions of membership are satisfied. Additional voting and nonvoting members may be any person approved or appointed by the dean of the Graduate School. All members of the committee will attend the comprehensive oral and the final defense for the dissertation. No change in membership of the doctoral committee may be made without prior approval from the dean of the Graduate School.

Program of Study

A student who has completed 12 credits of graduate work beyond the master's degree, or its equivalent, in residence at New Mexico State University, and has successfully completed the qualifying examination, should file the "Program of Study and Committee for Doctoral Students" form (also called "Program of Study") for the doctorate before registering for additional courses. This form may be obtained from Graduate Student Services, department offices, or from the website of Graduate Student Services: <http://prospective.nmsu.edu/graduate/forms/index.html>. The "Program of Study" should be completed in consultation with the adviser and other members of the doctoral committee. This form should include the course number and abbreviated title with the credit hours. For courses already completed grades must be shown for both major and minor areas. The program recommended by the student's committee is subject to approval by the head of the major department, the head of the minor department (if applicable), the college dean, and the dean of the Graduate School.

The program of study should be designed to meet the campus residency requirement described in "Residency" and should include a minimum of 30 graduate credits (from NMSU or other approved graduate programs) plus 18 credits of dissertation work (700-level course).

Comprehensive Examination

Before admission to candidacy for a doctoral degree, the student must pass a comprehensive examination intended to test knowledge of the major and any approved minor fields of study. The student will be admitted to the examination after satisfaction of the language requirements (where applicable), after completion of adequate course work to the satisfaction of the major department and the Graduate School, and when considered by the committee to be adequately prepared.

Graduate Student Services should receive the "Program of Study and Committee for Doctoral Students" and standardized test scores (if required by the department) after the student passes the qualifying examination and before the comprehensive examination. **The oral examination form must be on file at Graduate Student Services at least ten working days prior to the proposed date for the examination.** The examination must be part written and part oral. The results of the oral examination will be reported to Graduate Student Services.

Any applicant for candidacy who fails the comprehensive examination may, upon recommendation of the committee and approval of the graduate dean, (1) be granted a second examination after a lapse of at least one semester or (2) be terminated from the doctoral program. The student must be duly registered for three credits of graduate course work in the Graduate School during the semester in which the comprehensive examination is taken. A student taking an oral examination during the summer must enroll for at least one credit for that term.

In general, there should be a time lapse of at least one year between the comprehensive and final oral examination. However, due to the type of research required in some departments and the method of administering the written comprehensive in other departments, such a time lapse is not always practical. In all cases there must be one semester between the comprehensive and the final oral examinations.

Time Limit

If more than five years have elapsed since the date of the comprehensive examination, the candidate will be required to take another comprehensive examination before admission to the final examination.

Advancement to Candidacy

A student will be formally advanced to candidacy upon the successful completion of the comprehensive examination, the recommendation of the committee, and the approval of the graduate dean.

A minimum of nine credits must be taken after successful completion of the comprehensive exam. A student may not register for dissertation credits (700) prior to successful completion of the qualifying exam. The dissertation preparation shall total at least 18 credits of courses numbered 700. The doctoral committee can impose additional requirements for courses numbered 700.

A student is admitted to the doctoral program after successful completion of the qualifying examination. After successful completion of the comprehensive examination, a student must continue to register for at least three credits of dissertation or graduate course work each regular semester until the dissertation is approved by the Graduate School and the copies have been accepted by the binding section in Branson Library. A student who fails to abide by this regulation will be considered withdrawn from the university, and, in order to resume studies, must formally apply for readmission and satisfy the requirements in effect at time of reapplication.

Final Examination

Every student working toward the doctoral degree will submit a dissertation embodying the results of original research. The dissertation is expected to demonstrate the student's ability in independent investigation and to be a contribution to human knowledge. The dissertation shall display a mastery of the literature of the subject field and present an organized, coherent development of ideas with a clear exposition of results, and provide a critical discussion of the limits and validity of the student's conclusions.

When a complete draft of the dissertation has been prepared, the student's doctoral committee (appointed after the qualifying examination) will conduct the final examination. The final examination is concerned primarily with the research work of the student as embodied in the dissertation, but it may be much broader and extend over the candidate's entire field of study. The intention of the final examination is to verify that the candidate has a satisfactory grasp of the major subject as a whole and has a general acquaintance with the fields of knowledge represented by the course of study. The final examination is entirely oral and is open to the public.

The final examination must be completed in accordance with the schedule provided in the academic calendar. The form requesting this examination is to be submitted by the department to Graduate Student Services ten working days before the examination is taken. This form may be found on the Web at <http://gradschool.nmsu.edu/forms-index.html> and is also available from the Graduate School and departmental offices.

The student must ensure that each member of the examining committee receives a copy of the dissertation no later than seven working days before the date of the final examination.

Any candidate who fails the final oral examination may (a) upon recommendation of the committee and approval of the graduate dean be granted a second examination after a lapse of at least one semester; or (b) be terminated from the doctoral program. Failure in the second examination disqualifies the candidate from obtaining the degree.

Registration During Regular Semesters and Summer Sessions

After successful completion of the comprehensive examination, a student must continue to register for at least three credits of dissertation or graduate course work each spring and fall semester until the dissertation is approved by the Graduate School and the copies have been accepted by the binding section in Branson Library. A student who fails to abide by this regulation will be considered withdrawn from the university and, in order to resume studies, must formally apply for readmission and satisfy the requirements in effect at time of reapplication.

During spring and fall semesters the doctoral candidate must register for three units of dissertation or other graduate course work. The candidate must have also applied for the degree by filing the "Application for Degree (Diploma)" by the deadline specified in the academic calendar.

If the final examination is to be held during the summer or the dissertation is to be completed during the summer, the student must register for one credit hour during the summer session in which the final examination will be held or the dissertation will be completed.

In order to graduate in the summer the student must have filed the "Application for Degree (Diploma)" by the posted deadline for the semester in which degree requirements will be completed.

Finalizing the Doctoral Dissertation

After successful completion of the final examination a copy of the dissertation must be submitted to the Graduate School for format review on or before

the deadline. The deadlines posted the Graduate School website at <http://grad-school.nmsu.edu/deadlines/deadlines.htm>.

The form and style of the dissertation must comply with the regulations given in the Guidelines for Preparing a Thesis or Dissertation <http://gradschool.nmsu.edu/Guidelines>. These guidelines also contain detailed information on the dissertation-approval process and binding. Candidates are encouraged to consult with the graduate editor on format, deadlines, and procedures before final typing.

The dissertation is not complete until copies have been accepted for binding by the binding section staff and until the microfilm agreement form has been completed and received in Branson Library.

Residency

The requirements for the doctoral degree ordinarily cannot be met in less than three years following the bachelor's degree.

The minimum campus residency requirement for the doctoral degree shall include enrollment in at least two semesters of classes taught by New Mexico State University faculty.

DECLARATION OF APPROVED MINOR

Any doctoral applicant for candidacy may declare up to two approved minors in addition to the major area of study. All minors must be approved by the minor department head and the dean of the Graduate School and normally consist of nine credits. Demonstration of competency in the minor area will be required at both comprehensive and final examinations.

FOREIGN LANGUAGE REQUIREMENTS

The Graduate School has no foreign language requirement. However, some departments require foreign languages for research. These requirements must be met before comprehensive orals are scheduled. For specific requirements for each doctoral degree, refer to the departmental sections of this catalog.

RESEARCH FACILITIES

The university recognizes and supports the concept of off-campus study and research as a valuable experience for graduate students. These experiences may take the form of internships, intensive study of specialized techniques with personnel at other institutions, and conducting research at specialized research facilities. Arrangements for such off-campus activities should be made with the student's committee and the graduate dean and should represent opportunities not normally available at this university. When the bulk of a student's research is to be conducted off-campus, both on- and off-campus advisers should be appointed and periodic meetings with the student's committee held to ensure timely progress. Such opportunities offer students considerable flexibility in their training and promote valuable contacts between the student, the university, industry, and research institutions. Students are encouraged to pursue these opportunities with their advisers and the graduate dean.

AGRICULTURAL EXPERIMENT STATION

The Agricultural Experiment Station is the research division of the College of Agricultural, Consumer and Environmental Sciences. Faculty, professional personnel, and graduate students conduct basic and applied research concerned with biological, physical, and economic phases of food and fiber production, processing, and distribution; consumer health and nutrition; and the social and economic aspects of rural living. Energy, environmental, and natural resource conservation aspects of these broad disciplines offer many opportunities for the graduate student to undertake meaningful research investigations in both the laboratory and the field.

There are eight departments on the main campus with excellent laboratory facilities for research. In addition, the station maintains 13 field research centers including eight agricultural science centers, a forestry research center, a livestock research center, an animal insect lab, and two research ranches.

The station provides financial support to graduate research assistants and cooperates with research institutes at the university and with various state and federal agencies in providing opportunities for graduate research programs covering a wide scope of student interests. For further information, e-mail aesdean@nmsu.edu Web Page: <http://aces.nmsu.edu/aes/>

ARTS AND SCIENCES RESEARCH CENTER

The research center is the coordinating office for all scholarly activities within the College of Arts and Sciences. The primary functions are service to departments and faculty members, and grant administration. The center encourages and stimulates individual research and creative efforts and facilitates the development of potential research programs within the college, and with other colleges, various institutes, the Physical Science Laboratory, and external organizations. Its major functions are assisting faculty members in the college in the preparation of proposals and reports, and providing various services and financial support to faculty members in the performance of scholarly activities. The center assists individual faculty members in the development of research programs by providing small grants of "seed" money. Typically, support services fall within, but are not limited to, the following areas:

- Location of funding sources
- Contact with granting agencies
- Proposal preparation, including budgets
- Administration of grants and contracts
- Bookkeeping on grants and contracts
- Liaison with Office of the Vice Provost for Research

The center provides technical support in the glassblowing, electronics, computing, networking, and machine shop areas. It also administers the Electron Microscopy Laboratory, which provides research support for the university, and the Computing Research Laboratory. For further information, e-mail jcowie@nmsu.edu. Web page: <http://www.nmsu.edu/~artsci/Research/center.html>.

APACHE POINT OBSERVATORY (APO-ARC)

Apache Point Observatory (APO) is located in the Sacramento Mountains of south-central New Mexico. This is a major astronomical research facility; its principal instrument is a fully equipped 3.5-meter telescope of advanced design. It is used for optical-infrared imaging, photometry, and spectroscopy. Apache Point Observatory is also the site of the Sloan Digital Sky Survey 2.5-meter telescope, which is used for a sensitive photometric and spectroscopic survey of the universe. NMSU operates its own 1-meter telescope at APO for wide field imaging.

Apache Point Observatory is owned by the Astrophysical Research Consortium (ARC). The consortium members include: New Mexico State University, Princeton University, the University of Colorado, the University of Chicago, the University of Washington, the Institute for Advanced Study, and Johns Hopkins University. NMSU manages and operates the observatory for the ARC consortium. Astronomy faculty and graduate students use the facility for various research projects. For further information, e-mail astro@nmsu.edu

BUREAU OF BUSINESS RESEARCH AND SERVICES

Founded in 1969, the bureau has two basic objectives. The first is to provide business and economic research services to both public and private sectors of the state, the region and the nation. Research capabilities in the behavioral and managerial sciences, business systems, economic and social sciences, marketing, and regional planning can be applied to problems relating to economic growth, business development, and community needs in New Mexico.

The second objective of the bureau is to provide management training services to business organizations and associations, to government agencies, and to the public as well. Management development seminars, training programs, and analytical services are designed to meet specific organizational needs.

The Bureau of Business Research and Services is a member of the Association for University Business and Economic Research. For further information, e-mail kboberg@nmsu.edu.

CARLSBAD ENVIRONMENTAL MONITORING & RESEARCH CENTER

Created in 1991 with a grant from the U.S. Department of Energy, the Carlsbad Environmental Monitoring & Research Center (CEMRC), a department of the College of Engineering, environmental research, provides special analytical services, technology development, and disseminates information for federal, state, and private sponsors. CEMRC is housed at Light Hall, a 26,000-square-foot facility located in Carlsbad, in southeast New Mexico. The facility's laboratories include radiochemistry and associated nuclear spectroscopy, environmental inorganic chemistry, in vivo bioassay, computer modeling, and field sampling. A primary activity of CEMRC is long-term environmental monitoring for contaminants in the region of the Waste Isolation Pilot Plant, located near Carlsbad. The data produced from this project are summarized in periodic reports and are

presented on the CEMRC web site at www.cemrc.org. Primary research areas of the CEMRC include studies of atmospheric dust and inorganic contaminants, human and ecological risk assessment, and development of radioanalytical and spectroscopic methods for measurement of naturally occurring and human-produced radioactive elements. Results of CEMRC research projects appear in peer-reviewed scientific journals and are presented at national and international meetings. For more information, contact Dr. James Conca at (575) 234-5555

CENTER FOR LATIN AMERICAN AND BORDER STUDIES

The Center for Latin American and Border Studies (CLABS) was established in 1979 by the College of Arts and Sciences and is located at the Nason House. In partnership with the Latin American and Iberian Institute at the University of New Mexico, CLABS is part of a National Resource Center consortium for Latin America, and is funded as such by the U.S. Department of Education. CLABS supports Frontera NorteSur, an on-line journal about the U.S.-Mexico border. In addition, CLABS supports the collection at the NMSU library, travel for faculty to conferences, language training in Spanish and Portuguese, lectures by visiting speakers, curriculum development for teachers, the student Latin American organization, and other outreach activities. It has a faculty governance organization and helps administer the Nason foundation fund. In recent years the center has pursued an active program of research on U.S.-Mexico border policy issues, in cooperation with several universities in Mexico. For further information, contact Neil Harvey at nharvey@nmsu.edu

COMPUTING RESEARCH LABORATORY

The NMSU Computing Research Laboratory (CRL) was established as a Center of Excellence for applications in advanced computing by the New Mexico state legislature. An interdisciplinary laboratory with researchers from several university departments, and its own staff of full-time researchers, CRL's basic research efforts are concentrated on approaches to multilingual processing of natural language texts. Core areas of research include artificial intelligence, computational linguistics, and human-computer interaction. CRL maintains its own computing facilities and provides an advanced development environment. CRL works closely with a variety of federal agencies and private corporations; all CRL's funds come from research grants and contracts. For further information see <http://crl.nmsu.edu> or e-mail jcowie@crl.nmsu.edu

COOPERATIVE EXTENSION SERVICE

As a land-grant institution, New Mexico State University has a tripartite mission—instruction, research, and extension. The three parts of this mission are closely interrelated and mutually reinforcing. New Mexico State University's Cooperative Extension Service serves a unique role in New Mexico. As the state's land-grant university, and as mandated by its charter, it is the "leading object" for agriculture, home economics, engineering, business, health sciences, as well as educational programs in the liberal arts and natural sciences. NMSU's uniqueness arises from its vision of teaching/learning, research, and extension/outreach functions—interdependent, mutually supportive, and central to its land-grant mission.

The extension aspect of the university's mission is the process of extending the intellectual expertise and resources of the university through teaching and applied research to address the social, civic, economic and environmental challenges and opportunities facing our state, region, nation, and global community. Extension entails an organized and planned program of activities; these activities bring the resources of the university to bear in a coherent and strategic fashion for the benefit of the citizens of New Mexico and the nation. Many faculty have split appointments with the Agricultural Experiment Station and serve as graduate advisors for students interested in extension as a career. For more information see <http://extension.nmsu.edu/>.

EDUCATIONAL RESEARCH CENTER (EDRC)

The Educational Research Center (EdRC) in the College of Education is the administrative office which supports faculty in obtaining and managing external funding. The academic which supports faculty in obtaining and managing external funding. The academic component of the ERC, under the direction of the Associate Dean for Research, Dr. Karin Wilburg, facilitates faculty involvement in research, publishing and outreach initiatives with the goal of building a strong research agenda for the college. For more information contact (kwilburg@nmsu.edu). The business component of the ERC is the Education Research and Budgeting Office (ERB) which assists in proposal submission, account setup

and monitoring and provides oversight for the College's unrestricted, restricted and legislative funds. For more information, contact the ERB Director, Dr. Wynn Egginton, (wegginto@nmsu.edu).

ELECTRON MICROSCOPY CORE LABORATORY

The Electron Microscopy Laboratory (EML) is a campus-wide, core facility providing all levels of technical support and consultation for investigators needing analytical and routine transmission, scanning electron microscopy, and light microscopy services. The integrated imaging facility is administered through the Office of the Vice President for Research and is considered a core research facility. The facility was established to furnish state-of-the-art microscopy instrumentation and techniques to investigators and their students for research and training. The laboratory is located in Skeen Hall, RM W152, and W160.

Director: Dr. Peter Cook

ENGINEERING RESEARCH CENTER

Research studies in engineering were started at New Mexico State University as early as 1930. The development since World War II has been relatively rapid and, since 1957, with the appointment of a full-time staff, the Engineering Research Center (ERC) has been well established to serve faculty and students as part of the organized research program of the university.

The financial support for ERC research activities comes from state appropriation funds; local, state, and federal agencies; and industry. In 2005, the ERC administered over \$82.2 million in open contracts, with research expenditures at \$15.5 million for the year. Engineering research programs employ approximately 1,000 students each year. ERC strives to encourage, foster, and promote research, and assist individual research projects in the college. ERC also administers research funds, integrates multidisciplinary research projects, and facilitates the liaisons required with university administrative units and nonuniversity organizations including local, state, and federal agencies.

GEOCHEMISTRY RESEARCH LABORATORY

The Department of Geological Sciences houses a number of analytical instruments, all of which are available for use by our undergraduate researchers. To analyze the atomic structure of crystalline substances, we have an X-ray diffractometer. The chemical composition of rocks is analyzed by our X-ray fluorescence spectrometer, and micro-analysis (approximately 100 microns diameter) of solids, liquids, and gases is accomplished with our nanosecond and picosecond laser-induced breakdown spectrometers. The heavy isotopic composition of samples can be determined using our thermal ionization mass spectrometer. Sample preparation equipment is available to support research on these instruments. In addition, mineral separation equipment including a jaw crusher, Gemini shaker table, Franz magnetic separator, and heavy liquids, is available for geochronologic or other mineralogic research projects.

Director: Dr. Nancy McMillan (nmcmillan@nmsu.edu)

INFORMATION AND COMMUNICATION TECHNOLOGIES

Information and Communication Technologies (ICT) supports all facets of NMSU's information technology and provides state-of-the-art resources to students. Students have access to a wide variety of Internet resources, including the high-speed research network and computing facilities ranging from PCs to Unix to mainframes. There are 16 university computer labs with major labs in Jacobs Hall and the Computer Center building, some available every hour every day of the year. Labs are equipped with software for word processing, spreadsheets, databases, statistics, desktop publishing, and more. Laser printers furnish students with high-quality output. The campus network, NMSU Net, interconnects all labs with other computing resources across the campus and around the world, providing students with access to research resources, electronic mail, remote archives, electronic bulletin boards, news groups, and web resources. For further information, contact ICT, MSC 3AT, NMSU, PO Box 30001, Las Cruces, NM 88003-8001; phone (575) 646 - 1840; or send e-mail to help@nmsu.edu. NMSU's web home page is located at www.nmsu.edu

INSTITUTE OF TECTONIC STUDIES (ITS)

The institute was established in July of 1998 in collaboration with the College of Arts and Sciences at New Mexico State University and the Department of Geological Sciences as an independent fiscal entity. The mission of the institute is to pursue the understanding of tectonic processes and the evolution of tectonic provinces. The immediate goal of the institute is to foster the growth

of expertise in tectonic studies of all Department of Geological Sciences faculty, graduate students and undergraduate majors.

Director: Dr. Katherine Giles (kgiles@nmsu.edu)

NEW MEXICO DEPARTMENT OF AGRICULTURE

The New Mexico Department of Agriculture (NMDA), under the control of the NMSU Board of Regents, is responsible for administering laws and regulations that daily affect the lives of every citizen of the state. These laws and regulations (concerning the production, preparation, processing, sale, and use of agricultural products; weights and measures; and petroleum products) are designed to assist producers, processors, and consumers. NMDA's marketing program provides guidance to commodity groups in the promotion of agricultural products. A broad consumer service in many areas other than agriculture is provided by the department. NMDA's director is New Mexico's secretary of agriculture and serves on the governor's cabinet as a liaison between state government and the agricultural industry. For further information, e-mail: pv@nmda.nmsu.edu NMDA's web site is at <http://www.nmda.nmsu.edu>.

NEW MEXICO WATER RESOURCES RESEARCH INSTITUTE

The New Mexico Water Resources Research Institute (WRRI) at NMSU, established in 1963, was one of the first of 54 water institutes in the United States. The WRRI program encompasses all state universities in New Mexico and public agencies sponsoring water research. The institute serves as a coordinator, assisting researchers in obtaining funds, working with granting agencies, and serving as the administrator for projects. The annual budget of approximately \$1 million is made available from federal, state, and/or private sources through a variety of grants and contracts. All research projects administered by the institute encourage graduate student participation. As a result, about 60 students a year receive scientific training through institute-sponsored projects. WRRI also sponsors the Annual New Mexico Water Conference, which has provided a public forum for state water issues since 1956. Public participation helps the institute focus its research program on areas of greatest need. The WRRI publishes research results of every project it administers and other miscellaneous reports. The WRRI also maintains a water resources library of more than 10,000 water-related documents on water issues facing New Mexico. E-mail may be sent to nmwrrri@wrrri.nmsu.edu. The WRRI's home page address is <http://wrrri.nmsu.edu/>.

NEW MEXICO STATE UNIVERSITY LIBRARY

The NMSU Library has research collections of over 1.8 million volumes and global access to research materials it does not own through its document delivery services.

The total library budget exceeds \$6.3 million. <http://lib.nmsu.edu/index.shtml>

OAK RIDGE ASSOCIATED UNIVERSITIES PROGRAM (ORAU)

Since 1991, students and faculty of New Mexico State University benefited from its membership in Oak Ridge Associated Universities (ORAU). ORAU is a consortium of 98 colleges and universities and a contractor for the U.S. Department of Energy (DOE) located in Oak Ridge, Tennessee. ORAU works with its member institutions to help their students and faculty gain access to federal research facilities throughout the country; to keep its members informed about opportunities for fellowship, scholarship, and research appointments; and to organize research alliances among its members.

Through the Oak Ridge Institute for Science and Education (ORISE), the DOA facility that ORAU operates, undergraduates, graduates, postgraduates, as well as faculty enjoy access to a multitude of opportunities for study and research. Students can participate in programs covering a wide variety of disciplines including business, earth sciences, epidemiology, engineering, physics, geological sciences, pharmacology, ocean sciences, biomedical sciences, nuclear chemistry, and mathematics. Appointment and program length range from one month to four years. Many of these programs are especially designed to increase the numbers of underrepresented minority students pursuing degrees in science- and engineering-related disciplines. A comprehensive listing of these programs and other opportunities, their disciplines, and details on locations and benefits can be found in the ORISE Catalog of Education and Training Programs, which is available at <http://www.orau.gov/orise/educ.htm>, or by calling either of the contacts below.

ORAU's Office of Partnership Development seeks opportunities for partnerships and alliances among ORAU's members, private industry, and major federal

facilities. Activities include faculty development programs, such as the Ralph E. Powe Junior Faculty Enhancement Awards, the Visiting Industrial Scholars Program, consortium research funding initiatives, faculty research and support programs as well as services to chief research officers.

For more information about ORAU and its programs, contact:

Vimal Chaitanya
Vice President for Research, Graduate Studies and International Programs
ORAU Councilor for New Mexico State University

Monnie E. Champion
ORAU Corporate Secretary (865-576-3306); or

Visit the ORAU Home Page (<http://www.orau.org>)

RESEARCH INITIATIVES IN THE COLLEGE OF EDUCATION

The College of Education has research initiatives and labs in the following areas: The Speech and Hearing Center's Benfer Lab purchased equipment from the endowment for voice and speech science research (Dr. Charlotte Mason, cmason@nmsu.edu). Special Education/Communication Disorders Department's Autism Research Initiative provides educational and research opportunities on the Autism Spectrum Disorder (Dr. Kathleen Cronin, kacronin@nmsu.edu). Alliance for the Advancement of Teaching and Learning in collaboration with the Southwest Regional Educational Lab REL(Institute for Educational Services, IES) provides research for partner school district practitioners on accountability, special education/response to intervention, literacy, leadership development, math and science achievement, and program evaluation (Dr. Eric Lopez, Leric@nmsu.edu). The Institute for Mathematics and Science Education oversees multiple mathematics and science grants as well as serving as the STEM Outreach Center for K-12 education (Dr. Susan Brown, susanbro@nmsu.edu). The Counseling and School Psychology Training and Research Center provides counseling services for students, training for graduate students in counseling, school psychology and counseling psychology, and conducts research on counseling outcomes and processes (Dr. Mike Waldo, miwaldo@nmsu.edu). The Southwest Institute for Early Childhood Studies in Poverty and Educational Equity is the research arm of multiple early childhood and family initiatives in the college (Dr. Candace Kaye, Kaye@nmsu.edu). A new Reading Research Center was recently established in the NMSU Children's Village and provides reading diagnostic services including analysis of reading using eye-tracking software (Dr. Koomi Kim, Koomi@nmsu.edu).

SOUTHWEST INSTITUTE FOR HEALTH DISPARITIES RESEARCH

To address the substantial health disparities that exist in Southern New Mexico and the U.S./Mexican Border Region, New Mexico State University has recently established the Southwest Institute for Health Disparities Research within the College of Health and Social Services. The purpose of the Institute is to assist faculty to secure external funding and conduct research which has the potential to reduce health disparities and improve minority health, provide health related community outreach programming, provide training for researchers, lay groundwork for additional funded research, and attract highly qualified minority faculty and graduate students to NMSU. Additionally, the Institute serves as the coordinating office for all scholarly activities within the College of Health and Social Services.

SPATIAL APPLICATIONS AND RESEARCH CENTER (SPARC)

The SpARC lab was established in 1982 as a contract applied research laboratory for the NMSU Geography Department. SpARC provides a variety of services including planning and research, GIS, image processing, modeling and training. The original purpose of the lab was to undertake externally funded projects under the direction of geography faculty and employ students within the department. Twenty-five years later, the lab continues to do project related work. It has employed more than 150 students, and provided assistance to more than 35 faculty members inside and outside geography. The primary clients of the lab have been federal state and local government agencies. The lab houses 11 high performance workstations, 2 large format digitizing tablets, and a HP 1050 large format plotter. Software available for use includes word processing and database software, ERDAS image processing software, TransCAD, and the entire suite of ESRI GIS software.

Director: Dr. Christopher Brown (brownchr@nmsu.edu)

TECHNICAL ASSISTANCE RESOURCE CENTER

The Technical Assistance and Resource Center (TARC), based at New Mexico State University, is to be an ally and a partner to local communities dealing with DMC throughout the state. TARC works from three goals: To provide technical assistance to three local sites (Taos, Santa Fe, and Las Cruces) regarding ongoing local DMC data collection and analysis and implications of data for training and program development, based on evidence-based best training/programmatic practices. To conduct qualitative data collection and analysis regarding the factors influencing juvenile justice professional decision making at the points of arrest and referral and implications for training and policy development statewide.

Director: Dr. Jim Maupin (jmaupin@nmsu.edu)

POSTDOCTORAL FELLOWSHIPS

Those individuals who are exemplary scholars, who have recently been awarded a doctoral degree, but who wish to continue their education and research experience under the direction of a professor at New Mexico State University are classified as postdoctoral. The postdoctoral fellowship is a regular professional appointment normally for one or two years. Under no circumstances will an individual remain in this classification for more than three years.

Postdoctoral fellowships are advertised and applications are submitted to the hiring department in compliance with the guidelines for hiring professional staff, but without the requirement for a position description questionnaire. An "E-Hire" staffing authorization request must be submitted to the office of Human Resources by the hiring department. No offer of employment may be made until approval has been given by Human Resources.

A postdoctoral fellow has the following privileges:

- may take six credits in spring and fall semesters, four credits per summer session without tuition charge
- is eligible to purchase an employee parking permit
- is eligible for other employee benefits available to regular employees, including annual and sick leave, as well as health, dental, and life insurances
- may purchase athletic tickets, activity tickets, and gymnasium privileges
- is eligible for library privileges

Persons classified as postdoctoral fellows pay Social Security and New Mexico State Educational Retirement.

RESOURCES FOR STUDENTS

ACADEMIC

EDGAR R. GARRETT SPEECH AND HEARING CENTER

Combining instruction, practical experience, and service, the center provides training for students in communication disorders and provides service to the community. Students have opportunities to participate in diagnostic evaluations and to provide therapy in the areas of speech, language, and hearing for clients across the lifespan.

Referrals are accepted from all sources (self, medical, school, nonprofessionals). The Edgar R. Garrett Speech and Hearing Center is a fee-for-service clinic where university students and their immediate family receive a reduced rate. All services are supervised by professional personnel licensed in New Mexico and holding the Certificate of Clinical Competence in Speech-Language Pathology or Audiology of the American Speech-Language-Hearing Association. Services are provided in English and/or Spanish. For further information, contact the Edgar R. Garrett Speech and Hearing Center, MSC 3SPE, New Mexico State University, P. O. Box 30001, Las Cruces, New Mexico 88003-8001, (575) 646-3906; (TTY)-(575) 646-6191).

OFFICE OF INTERNATIONAL AND BORDER PROGRAMS (IP)

The Office of International and Border Programs represents the university with U.S. government agencies, foreign governments, international education professional associations, and the private sector concerning international activi-

ties. The Office also advocates for effective practices, policies, and procedures to internationalize the university. The major program areas of the Office are:

International Development and Cooperation Management - IP facilitates the interests of faculty who wish to participate in international interdisciplinary projects requiring technical assistance, training or public outreach. This includes project identification, proposal development, project management, and development of international cooperative agreements with international entities or institutions.

US-Mexico Border Programs - IP has major responsibility for coordinating the university's involvement in US-Mexico cooperative projects including research, economic development and educational outreach.

Study Abroad Programs and Exchange Visitor Services - IP is the university's representative for the U.S. State Department's Exchange Visitor Program and develops and coordinates study abroad programs and services for outbound students and inbound exchange students and scholars.

Community Outreach and Public Service - IP adheres to the land-grant philosophy by providing programs and services to increase international understanding and awareness in the local and campus community, including southern New Mexico and the state of Chihuahua, Mexico.

STUDY ABROAD PROGRAMS AND EXCHANGE VISITOR SERVICES

This division of International and Border Programs is the international education program development and coordination unit that assists colleges and departments to integrate study abroad into the undergraduate and graduate curriculum. It manages support services for outbound study abroad students and inbound international exchange students and scholars and coordinates all international partner exchange agreements, such as the International Student Exchange Program (ISEP). The division also sponsors the Study Abroad Ambassadors Club, the NMSU Rotaract Service Club and the Global Village Living and Learning Community.

Students on the main campus and at all the branch community colleges in the NMSU system may apply to study or travel abroad while maintaining NMSU student status to receive regular course credit (graded A-F), international distance education language and teacher education credit (graded A-F), and/or transfer credit (graded CR). For exchanges with international partner institutions, students must have completed two full semesters of university study, maintained a 2.75+ grade-point average, and obtained permission of their college to receive transfer credit. For other programs student must be in good standing academically at NMSU, and receive permission to enroll from the course instructor or program coordinator. International Business majors must receive permission from their department for study abroad to count as required in their degree plan. At least four weeks of a study abroad program may count for 3 credits of Viewing a Wider World (<http://studyabroad.nmsu.edu>).

The Unit is also responsible for implementing the Exchange Visitor Program sponsored by NMSU under authority of the U.S. Department of State in support of the Mutual Educational and Cultural Exchange Act (Fulbright-Hayes Act) of 1961. The objective of the Exchange Visitor (J visa) Program is "to increase mutual understanding between the people of the United States and the people of other countries by means of educational and cultural exchanges." J Visa immigration services and other support services are coordinated for incoming exchange students, professors, research scholars, short-term scholars, and specialists invited to NMSU (<http://jexchangeservices.nmsu.edu>).

TESTING SERVICES

Testing Services (575) 646-1921 provides test information and registration materials for the following tests: American College Testing Assessment (ACT); College Level Examination Program (CLEP); General Education Development (GED); Graduate Management Admission Test (GMAT); Graduate Record Exam (GRE); Miller Analogies Test (MAT); PRAXIS Series; Pre-Professional Skills Test (PPST); and New Mexico Teacher Assessments, and others.

WESTERN INTERSTATE COMMISSION FOR HIGHER EDUCATION

NMSU collaborates with the Western Interstate Commission for Higher Education (WICHE) in recommending graduates of the university for programs in dentistry, graduate library studies, occupational therapy, optometry, osteopathy, podiatry, public health, and veterinary medicine in universities of other western states. The State of New Mexico subsidizes the education of New Mexico residents when approved for training in these fields in other states. This subsidy is a loan-for-service program which permits New Mexico residents to attend state-supported institutions at in-state tuition rates and private institutions at approximately one-third the standard tuition cost if they practice in New Mexico for an equal number of years after graduation. This program is contingent upon

funding by the state legislature. For further information write the Certifying Officer for New Mexico, WICHE's Student Exchange Program, New Mexico Higher Education Department, 2048 Galisteo St., Santa Fe, NM 87505-2100.

INVOLVEMENT

CAMPUS ACTIVITIES

The Department of Campus Activities offers outside the classroom involvement, an essential complement to the student's academics. Leadership and personal growth opportunities are offered through student organizations, Greek Life, and National Student Exchange. Students are expected to take advantage of the Student Involvement Log (co-curricular transcript) and/or the Leader Certificate Program to optimize their university experience.

This office also coordinates activities and events through the Activity Registration process, administers the University Sales and Solicitation Policy, serves as liaison to the InterFaith Council, and is responsible for the Student Handbook.

ON-CAMPUS SERVICES

CAMPUS DINING

Graduate students living in campus housing may participate in the meal plan program. A variety of plans which combine dining hall entrances with flex money are available. Students who choose not to live in campus housing may participate in the meal plan program as well. Application procedures and additional information may be obtained from the ID Card Services Office by calling 575-646-4835 or via e-mail at idsvs@nmsu.edu. The mailing address is MSC 3AUX, NMSU PO Box 30004, Las Cruces, NM 88003.

Other Food Service Options

In addition to the meal membership program, food service is available at various locations throughout the campus by using cash, NMSU Aggie Ca\$h, the NMSU Enhanced Aggie Access Card, or in some areas, the Flex Points included with the meal plan package. Food service location hours are available at <http://www.nmsu.edu/~dining> under "Food Guide." Additional information can be obtained by contacting the ID Card Office at 575-646-4835 or <http://www.nmsu.edu/~idsvs>.

CORBETT CENTER STUDENT UNION

Corbett Center Student Union (CCSU) serves as the center for campus life, providing programs and services for students and other members of the university community. A place to study, relax, meet with student groups, work or play, CCSU offers students, faculty and staff a variety of services and activities. The union is the home to several administrative offices, Campus Activities, ASNMSU, the student radio station and student newspaper. Services offered by CCSU include meeting rooms, an auditorium, multiple dining facilities (both retail and residential), a Barnes & Noble bookstore, a game room and computer lab, study areas, post office and a convenience store. For more information call (575) 646-4530 or visit the Web site at <http://ccsu.nmsu.edu/>.

HOUSING AND RESIDENTIAL LIFE

Living on campus is designed to offer many opportunities for campus involvement and social interaction with other students. Many options and lifestyle choices are available to students who choose to live on campus. For more detailed information on the options listed below, visit our web site at www.nmsu.edu/~housing.

Vista del Monte and Cervantes Village Apartment Complexes

In these locations, the amenities of apartment living are combined with the convenience of an on-campus location. Individual apartments are designed to accommodate sophomores and above, as well as graduate students. Available options include four bedroom, two bedroom and efficiency suite apartments. Each apartment occupant has a private bedroom. Apartments are fully furnished. The charge includes all utilities, high speed data connectivity, and cable TV.

Student Family Housing

Student family housing is available for students who are married or have dependents living with them. Two-story townhouse apartments and single-story houses include two bedrooms, a bath, kitchen, and living room. Four-bedroom apartments include four bedrooms, two bathrooms, a kitchen and living room. All units are unfurnished except for the stove and refrigerator. Washing machine hook-ups are provided in the single story houses and townhouses only. The monthly rent includes all utilities, local phone service, high speed data connectivity and cable TV. Some pets are allowed in parts of student family housing.

Availability of Units for Students with Disabilities

There are a limited number of specially equipped Vista del Monte apartments and family housing units available to students with disabilities (including students who use wheelchairs) who wish to reside in campus housing. These are assigned on a first-come, first-served basis. Specific needs or requirements (e.g., roll-in showers, special door openers, etc.) should be discussed with Office of Student Accessibility Services on an individual basis prior to submitting an application.

Application Acceptance Policy

The University reserves the right to refuse to give a housing assignment to any student. Examples of reasons for refusal include, but are not limited to, individuals who have a criminal history; individuals who have behavioral problems, which may, in the opinion of the university, negatively impact the group-living environment; individuals who have been previously evicted from campus housing; or individuals who have poor rental histories. The university will assign accommodations subject to the space available. The university will not guarantee assignments to a particular building, nor will it guarantee types of accommodations, specific rooms or apartments, roommates or single rooms. The university reserves the right to change or cancel assignments in the interest of order, health, safety or discipline with appropriate written notice. Completed applicants for housing should be submitted as early as possible, preferably one regular semester in advance. Single student housing applications require a prepayment at the time of application. Submission of the housing application indicates acceptance of the terms and conditions of the applicable agreement. The director of housing and residential life is responsible for administration of the housing agreement.

All housing areas require at least part-time enrollment during the regular academic year. Continuing housing residents are not required to enroll during summer sessions.

Completed applications for student family housing should be submitted at least six to eight months in advance. Family housing is assigned from a waiting list based on the date of application. Family housing occupancy is month-to-month, with thirty (30) days notice required to vacation.

For More Information

Specific information on services offered, qualifications, and application procedures may be obtained from the Department of Housing and Residential Life, MSC 3BB, NMSU, P O Box 30001, Las Cruces, NM 88003-8001, by phone at (575) 646-3202, or via e-mail at housing@nmsu.edu.

ID CARD SERVICES

The NMSU Aggie Access card is the primary source of student identification for the campus. The I.D. card serves as a membership card for meals, Aggie Ca\$h, as a key in some residential buildings, carries proof of eligibility for access to athletic events and allows for other student services. This information is added to your card after registration for classes and financial arrangements have been completed. Please visit <http://www.nmsu.edu/~idsvs> for more information.

Aggie Ca\$h is a pre-paid account that allows you to use your Aggie Access card to make purchases at locations all over campus. The NMSU Enhanced Aggie Access Card allows your student card to also be your Wells Fargo debit card. The ID Card Services Office in Corbett Center has the information and applications you will need.

INTERNATIONAL STUDENT SERVICES (ISS)

The International Student Services office administers processes and programs at NMSU that relate specifically to international students, coordinates the admissions process for international applicants at NMSU, and serves as the liaison office for international students at NMSU. Direct contacts with U. S. government agencies, foreign governments, and the private sector concerning international students at NMSU are handled through this office. Professional staff in ISS are appointed by NMSU and authorized by the U.S. Department of Homeland Security (DHS), to serve as "designated officials" regarding DHS regulations governing international students.

International Student Services provides a full range of services to international students, including orientation programs, immigration and financial advising, community outreach programming, and international student admission to the university. International students or agencies sponsoring international students receiving special services are expected to pay additional administrative fees, normally not to exceed \$550 annually. The current "International Student Special Service Fee Schedule" is available upon request. ISS is responsible for the issuance of I-20 and DS-2019 immigration documents to international stu-

dents admitted to NMSU. Staff members maintain up-to-date information on all regulations of the Department of Homeland Security governing student visas and help international students retain their legal status while attending NMSU. They coordinate contact between various community groups and the international student population. ISS requires all international students to have Student Health Center coverage and adequate health insurance, including their dependents.

The ISS office is located in Educational Services Building, Room 8. (575) 646-2017. For further information, e-mail ias@nmsu.edu and visit our web page at <http://prospective.nmsu.edu/international/>.

PARKING OFFICE

Transportation & Parking Services is responsible for administering the parking program for NMSU. This includes the development of parking lots, issuance of parking permits and enforcement of parking regulations. Commuter Student Permits and Resident Student Permits are available and may be purchased Monday through Friday from 8 a.m. – 4:30 p.m. at the Parking Department located at 725 College Drive, on-line at <http://www.nmsuparking.com/permit2.html>, or by completing a Mail Order Permit Request at <http://www.nmsuparking.com/permits.html>.

Individuals who choose to park on NMSU campus parking lots or on NMSU campus streets must obtain and display an NMSU parking permit, pay at the meter or park in the free parking lots. To lessen parking difficulties for students, faculty and staff, AggieTransit is available to those individuals who opt to park in the free parking lot east of Pan American Center. Permit regulations are enforced between the hours of 7:30 a.m. and 4:30 p.m. Disabled parking spaces, emergency/fire zones, service zones and yellow curbs are enforced 24 hours a day. Parking Regulations and campus maps are available on-line at <http://www.nmsuparking.com>.

CAMPUS HEALTH CENTER

The university maintains a well- equipped health center on campus, with a comprehensive laboratory, pharmacy, and x-ray services. Hospitalization is available in the community. Graduate students enrolled for 9 or more credits (4 in a summer session) may use the Campus Health Center. Graduate students enrolled for 6-8 credits (3 in summer session) may choose to pay the wellness fee at registration to become eligible for medical care. For a description of the graduate assistant health insurance benefit see that section earlier in this catalog.

Information on Supplemental Health Insurance can be picked up at the Campus Health Center or by calling (575) 646-5706. For more information regarding the Campus Health Center or the health insurance policy call the number listed above or e-mail to debramon@nmsu.edu or visit our web page at <http://www.nmsu.edu/~shc/>.

VETERANS PROGRAMS

See section Military/Veterans and Family Members.

SUPPORT FOR SUCCESS**ALL THINGS MILITARY**

See section Military/Veterans and Family Members.

CAREER SERVICES

Career Services (CS), located in Garcia Annex, Room 224, supports the career planning efforts of students and alumni. Many candidates for employment utilize this resource as part of a comprehensive plan to develop successful job-search strategies. Pertinent services include individual- and group-advising sessions on topics related to the job-search process. These topics include effective resume writing and job-search correspondence, developing interviewing skills, designing successful job-search strategies, and evaluating offers of employment. Sections of the department's career library are devoted to these career-planning topics and are available on a drop-in or check-out basis. Employer directories are also available for reference. The work-integrated learning component of the Department is comprised of the Cooperative Education (Co-op)/Internship Program and part-time community employment. In order to gain professionally-related work experience, students are advised to seek opportunities for co-op, internships, or summer employment through the work-integrated program. Information on part-time student employment with the University is available by logging onto the Department's web site and searching SES Ventana.

To promote access to up-to-date career and educational information, the department sponsors several annual career fairs. In September Career Expo brings numerous employers from business, industry and government to campus. The Public Service Career Showcase, held in November, has as its focus municipal, state, and federal government employers, while the Employment Extrava-

ganza, a spring event, provides a look at New Mexico Employers. Undergraduate and graduate students use career fairs to gather key information and discuss opportunities for part-time jobs, internships, cooperative education, and professional employment.

Students wishing to further their education may wish to participate in the Graduate and Professional School Fair, which is held every fall semester. This event provides opportunities to discuss admission and degree requirements with representatives from diverse institutions located nationwide. Each spring hundreds of interviews between prospective employers and graduating students pursuing careers in education are conducted at the Educators' Job Fair. This premier event, co-sponsored by CS and the College of Education, showcases approximately 100 public school districts from the western United States that are actively recruiting teaching and educational specialty personnel.

Career Services provides an added dimension to the career planning activities of candidates who elect to use its resources. The staff actively supports the efforts of students and alumni who are seeking suitable employment commensurate with their education and abilities.

For further information, call (575) 646-1631, e-mail hirenmsu@nmsu.edu, or view our web page: careerservices.nmsu.edu.

COUNSELING CENTER

The Counseling Center provides students and the campus with a variety of services including individual, couples and group counseling, crisis intervention, career exploration, outreach programs, and consultation. We assist students with issues such as relationship conflicts, depression, anxiety, stress management, and self-esteem concerns. All services are strictly confidential and are free. The Counseling Center is located in Garcia Annex Room 100, and is open Monday through Friday, 8:00 a.m. - 5:00 p.m. and other times as needed. The Counseling Center is staffed by professional counselors and psychologists and is accredited by the International Association of Counseling Services, Inc.

The Career Exploration Center, located on the northeast corner of Garcia Annex adjacent to the Counseling Center, provides students with assistance in career choice and selecting an appropriate area of study. An excellent library is available for reference use and check out. For more information check our web site at www.nmsu.edu/~counsel/.

WAVE: Wellness, Alcohol, and Violence Education Program is comprised of the Choices program that provides campus organizations, classes and other groups with information concerning the decisions that surround drinking alcohol and provides presentations on sexual assault and violence prevention. The Crisis Assistance Crisis Line (CALL) is a 24-hour crisis line that is available to students and residents in southern New Mexico. To contact the CALL, dial 575-646-CALL.

Social Work Services (accessed through the Counseling Center at 646-2731) provides assistance in locating community resources such as food, shelter, health care, child care, or locating financial assistance when a student's educational goals are impeded by a lack of such resources.

STUDENT ACCESSIBILITY SERVICES

New Mexico State University is committed to providing information and services that will assist students with disabilities. The Student Accessibility Services Office provides auxiliary services, assistive technology, student advocacy, referral to appropriate sources for accommodation, and other services to aid students with documented disabilities. Services are provided with the goals of assisting students with disabilities to maximize their educational experiences and opportunities, become integrated into the campus community, and to maximize their independence.

All students requesting assistance are encouraged to discuss their needs with the director/coordinator on or before entry into the university and to complete a Petition for Accommodation form, available in Room 244, Corbett Center, (575) 646-6840 (voice), (575) 646-1918 (TDD/text telephone), (575) 541-3439 (Videophone) or at MSC 4149, P O Box 30001, Las Cruces, NM 88003-0001, e-mail sas@nmsu.edu, or on the web at www.nmsu.edu/~ssd/.

STUDENT SPECIAL CARE POLICY

To ensure the safety and well-being of its students, New Mexico State University may, on occasion, require that students receive a particular type of care or treatment (i.e., emergency medical attention, live-in attendants, or vaccinations) as a condition of continued enrollment or eligibility to reside in university-operated housing. When this care or treatment is required by the cognizant university administrator, the student will be obligated to assume any financial responsibility associated with the treatment. Furthermore, the university may, on occasion, contact a student's parents, legal guardian, or spouse in cases of extreme emergency, or where a possibility of imminent harm exists. This will

occur only when, in the judgment of the appropriate official, the best interests of the student and the university will be served.

When practical, the university will, in writing, notify the student of the university's intention to undertake the steps authorized by this policy. This decision may be appealed by the student to the associate provost for student affairs and community colleges within 24 hours of notification. The appeal should be in writing and clearly state the reason why the student objects to the proposed action. The associate provost will review the facts in the case and convey a decision to all parties within 48 hours. The decision of the associate provost shall be final.

STUDENT SUCCESS CENTERS-HARDMAN/ZUHL

New Mexico State University offers a variety of learning assistance, advising, and tutorial services via two Student Success Centers; Student Success Center-Hardman and Student Success Center-Zuhl. Both Student Success Centers are centrally located on the main campus, Hardman Hall Room 210 and Zuhl Library Second Floor, and provide no-fee services to assist NMSU students reach their academic potential. Services provided at the Student Success Centers are specific to location and are described below:

The Student Success Center-Hardman (SSC-Hardman) provides study skills assistance in such areas as time management, memory, concentration, note taking, reading, test preparation, test taking, math/science study skills, speed reading, critical thinking, financial literacy, and graduate school and professional skills test preparation. The services are available to students in the following formats:

- 1) Individualized assistance is provided to any student who walks in at the SSC-Hardman. This is a no-fee service.
- 2) Degree credit is offered under UNIV 110, Personal Learning Skills; UNIV 112, Academic and Personal Effectiveness; UNIV 113, Speed Reading; UNIV 150, The Freshman Year Experience; UNIV 300, Preparing for the GRE; UNIV 350, Peer Education; and UNIV 395, Independent Study.
- 3) Learning strategies and study-skills workshops provide quick assistance in one-hour presentations offered throughout the semester.
- 4) Professional and graduate school workshops provide development in such areas as speed reading, getting into graduate school, preparing for the GRE, GMAT, LSAT, MCAT, or NMTA.
- 5) SSC-Hardman staff provide outreach presentations on learning and study-skills topics to classes, programs, and organizations on campus.
- 6) The "Red to Green Money Management Program" is a financial literacy service offering outreach workshops and one on one meetings to students with Peer Coaches.

The Center also houses a 16 station student computer lab.

The SSC-Zuhl hosts two support programs:

The Campus Tutoring Service (CTS) provides walk-in and online tutoring at no charge; and the QuickConnect Early Alert and Intervention Program is an early warning and intervention system, utilized by faculty, focused on new-year students.

TECHNOLOGY

INFORMATION AND COMMUNICATION TECHNOLOGIES

Information and Communication Technologies (ICT) provides the university community with the computing resources and services that support the educational, research, and public service missions of the university. The resources include NMSU's central computing systems, the network that supports the systems and the wired and wireless functionality through which the internet is accessed. ICT operates the student computer labs found throughout the main campus, manages computer checkout, network registration of computers required for access to the NMSU network, discounts for purchases of computers and Aggie print at the university. ICT also provides support for NMSU technology users through its Help Desk.

For further information, contact ICT: MSC 3AT, NMSU P.O. Box 30001, Las Cruces, NM 88003-8001, (575) 646-1840 or email help@nmsu.edu. ICT's web homepage is located at help.nmsu.edu.

COLLEGE of AGRICULTURAL, CONSUMER AND ENVIRONMENTAL SCIENCES

Dean and Chief Administrative Officer and Regents Professor • *Lowell B. Catlett*

Associate Dean and Director of Academic Programs • *James D. Libbin*

Associate Dean and Director of the Cooperative Extension Service • *Jon C. Boren*

Associate Dean and Director of the Agricultural Experiment Station • *David Thompson*

Scholarship Coordinator • *Will Waller*

Assistant Director of Student Services • *Kristy Mason*

AGRICULTURAL AND EXTENSION EDUCATION

Department website: <http://aces.nmsu.edu/academics/axed/>
(575) 646-4511
cclary@nmsu.edu

C.R. Clary, interim department head, Ph.D. (North Carolina State University) - agricultural marketing, leadership, student success, T. J. Dormody, Ph.D. (Cornell)-agricultural education, leadership, and agricultural communications; J.Gleason, Ed.D. (Virginia Tech)-instructional technology, agricultural communications, and multimedia education; F. Hodnett, Ph.D. (New Mexico State) youth development, youth leadership, youth program development; C. Rosencrans, Ph.D. (Iowa State)-agricultural mechanics, technology education and youth development; B. Seevers, Ph.D. (Ohio State)-adult and extension education; P. Skelton, Ph.D., (University of Nebraska) youth development, sustainable agriculture and natural resource management; K. Stair, Ed.D., (North Carolina State University) agricultural education, teacher preparation, students with special needs; D. VanLeeuwen, Ph.D. (Oregon State)-statistics and research design

DEGREE: Master of Arts

MAJOR: Agricultural and Extension Education

MINOR: Agricultural Extension Education International Agricultural Development and Extension

The department offers major work for a Master of Arts in Agricultural and Extension Education. The degree can be obtained with emphasis in agricultural or technology teacher education, Extension education, international extension and development, and adult non-formal education.

Courses in research methods, teaching methods, and data collection and analysis; a graduate seminar; and a thesis or creative component are required for the major. A nine-credit minor is available to students completing major work in other departments.

The Department of Agricultural and Extension Education requires the following items for admission:

- Three letters of recommendation - Applicants should request letters of recommendation from individuals who know them well enough to comment on their professional skills and abilities, and on their ability to complete graduate-level work.
- Career statement - The two-page letter of application should clearly identify applicant's professional and career goals as well as reasons for pursuing graduate school.
- Personal Interview - Upon receipt of all application materials, a personal interview may be required at the discretion of the Departmental Graduate Committee.

The above requested materials should be sent directly to the department. Do not send to the Graduate School as this will cause a delay on your admission status.

A minimum of 30 semester credits (including 4-6 credits of thesis) is required under the thesis plan. A nonthesis plan is available and requires 32

semester credits of course work (includes a focused creative component). Both plans require a final oral examination.

Flexibility in each program allows students to pursue professional interests and to develop specialized competencies in agricultural and Extension education, technology education, and in technical and scientific areas. The department delivers courses in evening, weekend, and distance formats (go to distance. nmsu.edu and click on degree programs, and then Agricultural and Extension Education) to accommodate student needs. Previous experience in teaching, Extension, and/or other professional education positions is highly recommended to be considered for graduate teaching assistantships.

AGRICULTURAL AND EXTENSION EDUCATION

- AXED 456. Introduction to Research Methods 3 cr.
Introduction to research design and methodology in education and behavioral sciences. Overview of common research designs and data collection strategies. Prepares students to critique published research and understand basic skills including hypothesis development and conducting a literature search. Prerequisite: junior standing.
- AXED 460. Methods in Career and Technical Laboratory Instruction 2 cr.
For students planning to teach agricultural or technology education at a secondary or postsecondary level. Focus on planning, delivering, and evaluating instruction in laboratories; and on CPR, first aid, and NCCER certifications. Laboratory safety and tool, equipment, and laboratory management systems are also emphasized. Restricted to AXED Majors.
- AXED 466V. John Muir: Lessons in Sustainability 3 cr.
This course examines the life of John Muir in the context of sustainability. Muir was a farmer, inventor, explorer, botanist, glaciologist, conservationist, and noted nature author. He was influential in the National Parks movement and in starting the Sierra Club. Living in the natural world influences his faith and philosophy. By examining his life and the themes that shaped it, students will develop an understanding of what it means to live sustainably and to contribute beyond their personal lives to a sustainable past.
- AXED 469. Experiential Learning in Career/Technical Education for Exceptional Learners in a Diverse Society 3 cr.
Addresses the planning, delivering and evaluation of experiential learning activities for students with special needs. Specific strategies for working with students with special needs in a shop or laboratory setting within the Career and Technical Education environment will be included. Taught with AXED 569 and SPED 569. Prerequisite(s): SPED 350. Crosslisted with: SPED 469
- AXED 475. Leadership On Agricultural and Natural Resource Issues 3 cr.
Investigates leadership concepts and group dynamics as they relate to a changing world and complex agricultural and natural resource issues. Topics include emotional intelligence, leading change, political leadership, facilitating agreement, team building, and managing conflict in agricultural and natural resource settings.
- AXED 480. International Agricultural Development 3 cr.
Introduction to Agricultural topics (products, people, environment, culture, etc) that affect international development. Topics provide students with awareness, knowledge and understanding of teaching, research and service opportunities for those seeking experience or careers in international agricultural development. Taught with AXED 580.
- AXED 485. Agriscience Laboratory Applications 3 cr.
Students learn to set up and teach in a modular agriscience laboratory, utilizing a variety of technologies. Modules covered may vary from semes-

- ter to semester, but examples are: aquaculture systems, microscopy, tissue culture, soil and water testing, electrophoresis, hydroponics, global positioning systems, robotics, and presentation technologies. Students may develop their own modules and/or experiments. Graduate students will assist in laboratory set up and delivery. Prerequisite: Junior standing or above.
- AXED 486. Effective Management of Volunteer Programs 3 cr.
For individuals currently involved in, or interested in being involved in, the management and supervision of volunteer programs. Emphasis on practical application, utilizing a research and academic base. Explores the roles, functions, and tasks of volunteers and managers of volunteers including recruitment, orientation and training, supervision, evaluation, recognition and retention.
- AXED 487. The Cooperative Extension Service: An Overview 1 cr.
On-line course addressing the history, mission, philosophy, structure, program areas and delivery methods of the Cooperative Extension Service. Course is relevant for anyone pursuing a career in Cooperative Extension.
- AXED 488. 4-H Youth Development 1 cr.
On-line course explores 4-H Youth Development as an integral part of the Cooperative Extension Service. Topics to be addressed include mission, philosophy, delivery modes, audiences and partnerships. Course is relevant for anyone interested in pursuing a career in Cooperative Extension.
- AXED 489. The FFA Organization: An Overview 1 cr.
Online course addressing the history, mission, philosophy and structure of the New Mexico and National FFA Organizations and their relationship to supervised agriculture experiences and the agricultural education curriculum. Course is relevant for anyone interested in pursuing a career in agricultural education.
- AXED 490. Independent Study in Agricultural, Extension, or Technology Education 1-3 cr.
Specific subjects are agreed upon by the student and instructor. Prerequisites: junior or senior standing and consent of instructor. May be repeated for a maximum of 6 credits.
- AXED 499. Undergraduate Research 1-4 cr.
Research experience in agricultural, extension, and technology education with applications to selected issues and problems. Prerequisites: consent of instructor, adviser, and department head.
- AXED 500. The Diffusion and Adoption of Agricultural Innovations 3 cr.
Factors that influence rates of diffusion and adoption of innovations. Consequences of adopting or rejecting innovations. Processes by which change agents influence introduction and adoption of innovations. Taught with AXED 400 with differential assignments for graduate students.
- AXED 515. Youth Program Development and Management 3 cr.
Designed for professionals involved in youth group activities. Basic concepts in planning, conducting, and managing educational youth programs in a variety of organizations. Same as AXED 415 with differentiated assignments for graduate students.
- AXED 521. Curriculum and Instruction: The Problem-Solving Approach in Career and Technical Education 3 cr.
Developing curriculum and planning, delivering, and evaluating instruction for a problem-solving teaching approach. Historical and philosophical foundations for problem-solving teaching. Application of principles during microteaching experiences. Taught with AXED 421 with differentiated assignments for graduate students.
- AXED 525. Graduate Teaching Methods 3 cr.
Examines the teaching and learning process, emphasizing the use of appropriate methods for teaching career and technical education subjects to youth or adults in formal and nonformal educational settings. Includes principles of teaching and learning styles, levels of cognition, syllabus development, lesson planning, teaching using a variety of methods, and evaluating students. For students who have no prior education in teaching methods.
- AXED 530. Teaching Adults in Nonformal Settings 3 cr.
The adult and postsecondary learner; adult learning styles and principles; use of community resources and problem-solving techniques; and learning strategies for adults in formal and nonformal education. Same as AXED 430 with differentiated assignments for graduate students.
- AXED 536. Keys for Agricultural and Rural Development 3 cr.
Introduction to concepts of development, the process of change, key factors that contribute to agricultural and rural development in a community, and strategies employed to effect change with implications for international students or domestic students planning to work internationally.
- AXED 544. Planning and Methods in Nonformal Education 3 cr.
Identifying trends and resources of a community and planning community-based extension and nonformal education programs. Preliminary methods for teaching and evaluating nonformal education programs. Same as AXED 444 with differentiated assignments for graduate students.
- AXED 545. Developing Excellent Programs in Career and Technical Education 3 cr.
Students learn to develop excellence in the three components of a successful secondary school program in career and technical education: classroom and laboratory instruction, career and technical student organizations, and career development activities. Community-based program planning, utilizing partners, program marketing, and professional development are addressed as strategies for achieving excellence. Methods of obtaining financing and maintaining accountability of the program are discussed. Same as AXED 445 with differentiated assignments for graduate students.
- AXED 546. Methods for Teaching Agricultural and Technology Education 3 cr.
Methods of instruction and presentation, selection of teaching aids and support materials, classroom management, development of a complete educational program, and microteaching experiences. Same as AXED 446. Prerequisites: GPA of 3.0 or above. Restricted to AXED Majors
- AXED 547. Directed Teaching in Agricultural or Technology Education 4-9 cr.
Fourteen-week off-campus professional experience in directed teaching and observation provided in selected centers under secondary agricultural and technology supervising teachers. Prerequisites: A teaching methods class and consent of instructor. Same as AXED 447 with reduced credit hours for graduate students. Restricted to AXED Majors
- AXED 548. Directed Teaching in Extension Education 4-9 cr.
Four- to fourteen-week professional experiences in directed teaching and observation provided in cooperative extension at the county, regional, or state level. Prerequisite: consent of instructor. Same as AXED 448 with reduced credit hours for graduate students. Restricted to majors.
- AXED 549. Directed Field Experience in Agricultural or Technology Education 4-9 cr.
A four-to-fourteen-week supervised learning experience in an approved teaching setting with application to educational, agricultural, technological, communications, public relations, or environmental practices. Prerequisite: consent of instructor. Same as AXED 449 with reduced credit hours for graduate students. Restricted to majors.
- AXED 556. Research Methods 3 cr.
Students learn the research process as it is applied to solving problems in the behavioral sciences. Prepares students to conduct and critique research and to diffuse research findings. Implications, applications, and ethics of research also stressed. Students develop a research proposal for a problem of their choice. Same as FCSC 556.
- AXED 565. New Mexico Water Issues 3 cr.
Designed for agricultural and natural resource professionals who must educate others or provide leadership on complex water issues in New Mexico. Students will travel to four distinct geographic and cultural regions of the state and study water policies, issues, and delivery technologies in each region. Specific areas covered will be determined by resource professionals who will present past, current and future issues involved in the distribution of water. Urban impacts on water use will also be investigated.
- AXED 569. Experiential Learning in Career/Technical Education for Exceptional Learners in a Diverse Society 3 cr.
Addresses the planning, delivering and evaluation of experiential learning activities for students with special needs. Specific strategies for working with students with special needs in a shop or laboratory setting within the Career and Technical Education environment will be included. Taught with SPED 469 and AXED 469. Prerequisite(s): SPED 350 or SPED 500. Cross-listed with: SPED 569
- AXED 571. Data Collection and Analysis 3 cr.
Introduction to basic concepts of data collection and analysis. Interpretations from observational studies and controlled experiments. Roles of descriptive and inferential statistics in a complete data analysis. Mean, median, standard deviation, and graphical summaries of data. Correlation and simple regression. One- and two-sample tests and confidence intervals. Chi-square tests and basic analysis of variance. Competency in arithmetic and algebra required. An undergraduate statistics course recommended.
- AXED 575. Leadership on Agricultural and Natural Resource Issues 3 cr.
Investigates leadership concepts and group dynamics as they relate to a changing world and complex agricultural and natural resource issues. Topics include emotional intelligence, leading change, political leadership, facilitating agreement, team building, and managing conflict in agricultural and natural resource settings. Taught with AXED 475 with differential assignments for graduate students.
- AXED 580. International Agricultural Development 3 cr.
Introduction to agricultural topics (products, people, environment, culture, etc.) that affect international development. Topics provide students with awareness, knowledge and understanding of teaching, research, and ser-

vice opportunities for those seeking experience or careers in international agricultural development and education. Taught with AXED 480.

AXED 586. Effective Management of Volunteer Programs 3 cr.

For individuals currently involved in, or interested in being involved in, the management and supervision of volunteer programs. Emphasis on practical application, utilizing a research and academic base. Explores the roles, functions, and tasks of volunteers and managers of volunteers including recruitment, orientation and training, supervision, evaluation, recognition and retention. Taught with AXED 486 with differentiated assignments for graduate students.

AXED 590. Special Topics 1-4 cr.

Specific subjects and credits to be announced in the Schedule of Classes. Maximum of 4 credits per semester. No more than 6 credits toward degree.

AXED 593. Seminar 1-2 cr.

Contemporary issues and content areas in agricultural, extension, and technology education. Course subtitled. Maximum of 2 credits per course toward a degree. Graded S/U.

AXED 594. Workshops in Agricultural, Extension, and Technology Education 1-3 cr.

Workshop procedures applied to current trends in agricultural, extension, and technology education. Maximum of 7 credits toward a degree.

AXED 595. Internship/Cooperative Experience 1-6 cr.

Supervised professional on-the-job learning experience. Prerequisite: Consent of instructor. Maximum of 6 credits toward a degree.

AXED 597. Program Evaluation 3 cr.

Techniques to assist adult, career and technical, and nonformal personnel in making systematic appraisal of their programs.

AXED 598. Creative Component 1-4 cr.

For nonthesis program. Individual investigations or projects, either qualitative or quantitative studies. Prerequisite: consent of instructor. Maximum of 6 credits toward a degree.

AXED 599. Master's Thesis 1-6 cr.

Thesis.

AGRICULTURAL ECONOMICS AND AGRICULTURAL BUSINESS

Department Website: <http://aces.nmsu.edu/academics/aeab/>
(575) 646-3215
crawford@nmsu.edu

DEPARTMENT OF AGRICULTURAL ECONOMICS AND AGRICULTURAL BUSINESS:

Terry L. Crawford, interim department head, Ph.D. (Cornell University)-marketing, policy and pricing, quantitative methods, trade; R.N. Acharya, Ph.D. (Auburn University)-food safety, logistics management, technology adoption, and marketing; L.B. Catlett, Ph.D. (Iowa State)-marketing, futures, economics; C. Clary, Ph.D. (North Carolina State)-marketing, commodity advertising; J. A. Diemer, Ph.D. (Colorado State)-natural resources, regional economics; C. Falk, Ph.D. (Oklahoma State)-agricultural business, marketing; J.M. Fowler, Ph.D. (Iowa State)-forestry and range economics; W. D. Gorman, (Emeritus/Adjunct) Ph.D. (Oregon State)-agricultural business management, international marketing; J. Hawkes, Ph.D. (New Mexico State)-range management; B. H. Hurd, Ph.D. (California-Davis)-water and natural resource economics; J. D. Libbin, Ph.D. (Iowa State)-farm management, production economics; J. Lillywhite, Ph.D. (Purdue)-agribusiness marketing; M. Patrick, Ph.D. (Michigan State University)-Economic Development; R. Skaggs, Ph.D. (Utah State)-agriculture and natural resource policy; L. A. Torell, Ph.D. (Utah State)-range, ranch economics, production economics; F. A. Ward, Ph.D. (Colorado State)-resource economics, welfare economics

DEPARTMENT OF ECONOMICS AND INTERNATIONAL BUSINESS:

R. Adkisson, department head, Ph.D., (Nebraska) – international economics, public finance, institutional economics; Larry Blank, Ph.D. (University of Tennessee, Knoxville) – microeconomic theory, managerial economics and regulatory economics; K. Brook, Ph.D. (Texas-Austin)-macroeconomic theory, monetary policy; D. L. Clason, Ph.D. (Kansas State)-linear models, government statistics; D. L. Daniel, Ph.D. (Southern Methodist)-nonparametrics; M. Ellis (Emeritus), Ph.D. (California-Riverside) – comparative economic systems, medical economics; C. Enomoto, Ph.D. (Texas A&M)-econometrics, economic theory; C. A. Erickson,

Ph.D. (Arizona State)-monetary theory, macroeconomics; D. A. Gegax, Ph.D. (Wyoming)-public utility economics, industrial organization; W. R. Gould, Ph.D. (North Carolina State)-biological sampling, wildlife and fisheries estimation; Y. L. Lee, Ph.D. (Southern Illinois-Carbondale) – international finance, international trade, international system, economic developments; B. N. Matta, Ph.D. (Texas-Austin)-labor economics, managerial economics; Randy McFerrin, Ph.D. (Texas A & M University) – micro theory, principles and American economic history; J. T. McGuckin, Ph.D. (Wisconsin-Madison)-production economics, resource economics and policy; J. T. Peach, Ph.D. (Texas-Austin)-quantitative economics, border studies, economic development; A.V. Popp Ph.D. (Northern Illinois) – public finance; N. E. Schmidt, M.S. (New Mexico State)- experimental statistics; D. W. Smith, Ph.D. (Texas A&M)-linear models; R. L. Steiner, Ph.D. (Oklahoma State)-likelihood methods, discrete distributions; C. Meghan Starbuck, Ph.D. (University of New Mexico) – environmental/resource economics, development, international business; D. Van Leeuwen, Ph.D. (Oregon State)- statistics; B. Widner, Ph.D. (Colorado State) – urban/regional, public finance, development; E. S. Willman, Ph.D. (Indiana)-monetary policy, macroeconomic theory

DEGREE: Master of Agriculture
SPECIALIZATION: Agribusiness

DEGREE: Master of Business Administration
SPECIALIZATION: Agribusiness

DEGREE: Master of Science
MAJOR: Agricultural Economics

MINOR: Agricultural Economics

The Department of Agricultural Economics and Agricultural Business cooperates with the Department of Economics and International Business and the College of Business Administration and Economics to offer graduate programs in agricultural economics and economics, and a Master of Business Administration with specialization in Agribusiness. The programs are jointly administered by faculty from the two colleges. Graduate degrees include a Master of Science in agricultural economics, a Master of Agriculture with an agribusiness emphasis, and an MBA degree with specialization in agribusiness. The objectives of the 3 programs differ in emphasis. The two departments also offer a doctoral program, Doctor of Economic Development.

- **Master of Science (MS) in Agricultural Economics** program provides rigorous training in economic theory, applied economic analysis and quantitative methods and is designed to prepare students for professional careers in business, government, and research, and for continued education in pursuit of a Ph.D.
- **Master of Business Administration with Specialization in Agribusiness (MBA-AB)** prepares students for business and public sector careers in agriculture and the food and fiber industry. Graduates from this program are knowledgeable about U.S. and international food and fiber sectors and hold an AACSB International accredited MBA degree.
- **Master of Agriculture (MAG-AB) with Specialization in Agribusiness** provides students with backgrounds or interests in agriculture with graduate-level training in agribusiness and applied economics. It is an attractive degree alternative for individuals holding undergraduate degrees in various agricultural and food science fields, as well as degrees in agricultural economics and/or agricultural business and related fields.

All students in these programs must meet the requirements specified in the general regulations and requirements for admission to the Graduate School and to candidacy. To transfer between the three program options requires a change of major form be submitted through the Graduate School and approved by the program to which the application is made.

Teaching and research assistantships are available to qualified applicants on a competitive basis. It is not necessary to have a degree in economics or agricultural economics to enter the graduate program or to qualify for a teaching or research assistantships. An application and three letters of reference are required to be considered for any available assistantships. These forms can be obtained from the department.

DEGREE REQUIREMENTS

Master of Science (MS)

Students entering the MS program are required to have completed intermediate microeconomics and intermediate macroeconomics (completed with a B grade or better), a college-level calculus class, and a course in statistics that included linear regression analysis. Students that have not completed these courses may be admitted with the requirement that they take them as deficiencies at the beginning of their graduate program.

Completion of the Master of Science degree in agricultural economics requires completion of a minimum of 33 graduate credit hours. Twenty-one of the credits must have one of the following three prefixes: AEEC, ECON, or ECDV. Twenty-four of the credits must be associated with course numbers greater than 500. All students in the MS program must successfully complete the following core courses: AEEC 501, AEEC 502, AEEC 540, AEEC 585, and AEEC 599 (4-6 credit hours). Students pursuing the MS degree may not complete the graduate program with more than one C grade in the core courses. If a student receives C grades in two of these core classes one of the classes must be repeated with a grade of at least B. In addition to core courses, nine additional credits must be completed from an agricultural economics and agricultural business (AEAB) course block. AEEC 545 must be taken in the graduate program if an agricultural policy course was not taken as an undergraduate. Individual study (AEEC 596) is limited to 3 credits hours. Electives and up to 3 credits from the AEAB course block can be used to pursue a minor. A thesis is generally required, but a non-thesis option can be followed, AEEC 597. An oral defense of the thesis will be scheduled and completed according to the guidelines of the Graduate School. The oral defense must be preceded by an open seminar to present major research findings to faculty, fellow students, and the interested public.

Master of Business Administration with Specialization in Agribusiness

Candidates for the Master of Business Administration with specialization in Agribusiness (MBA-AB) must successfully complete a minimum of 36 graduate credit hours. Admission to the MBA-AB program is through the College of Business Administration and Economics. The program includes numerous prerequisites in economics, accounting, and business as defined in the Business Administration and Economics section of this catalog. AEEC 545 must be taken in the MBA-Agribusiness program if an agricultural policy course was not taken at the undergraduate level. A written paper and presentation following the guidelines described for BA 590 is required. MBA-AB students can take the required minimum 4 thesis credit hours to substitute for BA 590. If a thesis (AEEC 599) is written in-lieu of taking BA 590 an examining committee and thesis defense must be organized similar to that of the MS degree program. For more information about the requirements for the MBA specialization refer to the Business Administration and Economics section of this catalog.

Master of Agriculture with Specialization in Agribusiness

Candidates for the Master of Agriculture (MAG) with specialization in Agribusiness must successfully complete 33 graduate credits. Students entering the Master of Agriculture program are required to have completed intermediate microeconomics and intermediate macroeconomics, a college-level calculus class, and a course in statistics that included linear regression analysis. All prerequisite courses must be completed with a C grade or better. AEEC 545 must be taken in the graduate program if an agricultural policy course was not taken as an undergraduate. Those students not having completed these courses may be admitted with the requirement that the deficiencies be completed at the beginning of the graduate program.

All students in the MAG program must successfully complete the following core courses: AEEC 551, AEEC 556, FIN 503, and ACCT 503. Six additional credits must be completed from an agricultural economics and agricultural business block. An internship (AEEC 595, 3 cr.) or individual investigation (AEEC 598, 3 cr.) is also required. A thesis (AEEC 599, 4-6 cr.) is not required but can substitute for the internship or individual investigation. Individual study (AEEC 596) is limited to 3 credits. An oral defense must be scheduled and completed as prescribed by the Graduate School. The defense must be preceded by a public seminar to present major findings, experiences, and contributions of the individual investigation, internship, and/or thesis research to faculty, fellow students, and the interested public.

DOCTOR OF ECONOMIC DEVELOPMENT

The Doctor of Economic Development (DED) is a professional doctorate designed to provide advanced training for economic development professionals. It is not designed to prepare graduates for academic careers.

Candidates for the DED enter the program with the equivalent of a master's degree. DED students must successfully complete approximately 60 graduate credits beyond the hours required for entry. All students must meet the requirements specified in the general regulations and requirements for admission to the Graduate School and to candidacy. DED admission requirements include: (a) related master's degree or equivalent coursework; (b) one course in intermediate microeconomic theory and one course in macroeconomic theory with minimum grades of B; (c) one course in college-level calculus with a minimum grade of B; and (d) one course in statistics, including simple regression with a minimum grade of B. Additionally, students who have not completed graduate level courses in microeconomic theory, macroeconomic theory, and econometrics with grades of B or better will be required to successfully complete these courses early in the DED program.

All students in the DED program must successfully complete the following core courses: AEEC 501, AEEC 502, ECDV 550, ECDV 651, ECDV 661, ECDV 662, ECDV 664, ECDV 668, ECDV 671, and ECDV 689 (twice). In addition, students will complete at least one specialty area (nine semester hours) and 12-15 semesters of internship and final project. Intermediate and final comprehensive and oral exams will be given and will determine eligibility to continue in the program and/or to graduate. Detailed and updated information is available at the following website <http://business.nmsu.edu/~econ/ded/DEDweb.html>.

AGRICULTURAL ECONOMICS

AG E 450. Advanced Microcomputer Applications in Agriculture 3 cr. (2+2P)
An advanced course in electronic spreadsheets and the concepts and tools of database management emphasizing agricultural application. Same as AEEC 550 with additional work for graduate credit. Cannot receive credit for both AG E 450 and AEEC 550. Prerequisite: AG E 250 or consent of instructor.

AG E 451. Agribusiness Market Planning 3 cr.
Applications course in which self-managed teams develop and present marketing plans for agribusiness firms. Emphasis on integrating the marketing mix, particularly promotional elements. Prerequisites: AG E 305 or MKTG 305 or consent of instructor. Same as MKTG 451.

AG E 452. Food and Agricultural Products Marketing Research Techniques and Written and Oral Presentation Skill 3 cr.
This course focuses on learning marketing research methods applicable to developing new food and agricultural products and repositioning existing products for new markets. Students will be required to prepare precise written and oral marketing plans to industry standards and will have opportunities to present written and oral plans at national competitions. Prerequisite(s): AG E 451 or MKTG 451.

AG E 454. Community Economic Development 3 cr.
In this course students acquire knowledge and understanding of the tools and techniques and the process by which people in a community study the economic conditions of that community, determine its economic needs and unfulfilled opportunities, decide what can and should be done to improve the economic conditions in that community, and then move to achieve agreed-on economic goals and objectives. Prerequisite(s): ECON 251G and ECON 252G.

AG E 456. Agribusiness Management 3 cr.
Integration of production, marketing, accounting, finance, agricultural policy, human behavior, and business environment concepts in management of agricultural businesses using a decision case approach. Prerequisites: Senior standing.

AG E 470. Real Estate Appraisal 3 cr. (2+2P)
This course addresses issues influencing the value of real estate with some emphasis upon rural properties. Topics include courthouse records, property taxes, appraisal methodology, expert courtroom testimony, condemnation, and legal issues. Students will take field trips and write appraisals. Course material is relevant to students in Finance, Accounting, and Pre-Law, as well as Agriculture. Accredited for hours to apply to both pre-licensing and continuing education requirements of the New Mexico Real Estate Commission for both Appraisers and Real Estate Brokers. Prerequisite(s): Junior or above standing. Crosslisted with: FIN 470

AG E 475. Water Resource Management and Policy 3 cr.
Emphasis on integrating natural and social sciences, analytic methods, and critical reasoning skills to evaluate water resource policy and management issues. Extensive use of data and numerical applications applied to a vari-

ety of water resource topics. Familiarity with MS Excel or similar software is desirable. Prerequisite: junior or above standing.

- AG E 491. Linear Programming Methods 1 cr.
Methods, techniques, and uses of linear and quadratic programming applications in agricultural economics.
- AG E 499. Senior Thesis 3 cr.
Develop a thesis project with a faculty advisor. The senior thesis requires students to work creatively to apply business and economic principles to address a problem of concern. Prerequisites: consent of department head and have senior standing. Restricted to AEAB majors.

AGRICULTURAL ECONOMICS AND ECONOMICS

- AEEC 501. Microeconomic Theory 3 cr.
A rigorous re-examination of the pricing mechanism in the goods and factor markets. Development of theoretical tools of general applicability. Prerequisite(s): ECON 371 and ECON 457, or consent of instructor.
- AEEC 502. Macroeconomic Theory 3 cr.
Contemporary aggregative theory regarding the interrelationships among national income, employment, the price level, money supply and interest rates, and implications of this theory for public policy in a mixed economy.
- AEEC 511. Advanced Futures and Options Markets 3 cr.
Advanced hedging and speculating strategies using futures and options contracts. Coverage includes interest rates, stock indexes, metals, currencies, livestock, and grains. Concepts of price analysis (technical and fundamental) and basis analysis; technical paper is required. Prerequisite: AG E 311, FIN 311, or consent of instructor. Crosslisted with: FIN 511.
- AEEC 520. International Agricultural Trade Theory and Policy 3 cr.
Review and analysis of international trade models. Analysis of the effects of trade instruments such as tariffs, quotas, and subsidies on welfare and income distribution. Analysis of bilateral, regional, and multilateral trade agreements and their effect on the agricultural sector from both country-specific and global perspectives. Prerequisite: ECON 371.
- AEEC 522. Public Sector Economics I 3 cr.
Introduction to the economic rationale for government intervention in the economy and the effects of that intervention on economic agents and the economy in general. Emphasis on the expenditure side of government policies. Prerequisite: ECON 334 or ECON 434. Same as GOVT 522.
- AEEC 523. Public Sector Economics II 3 cr.
A continuation of AEEC 522. Concentrates on the economic effects of taxation. Same as GOVT 523.
- AEEC 526. Global Food Supply Chain Management 3 cr.
The proposed course aims to provide students a basic understanding of supply chain management issues, encourage them to analyze problems from a systems perspective, and introduce them to a number of decision tools that are currently being used by the industry such as process analysis, product design, waiting line management, quality control, just-in-time, and inventory management. Consent of instructor required.
- AEEC 528. Economic Development 3 cr.
A graduate-level exposition of microeconomic and macroeconomic theory of why and how nations allocate resources to grow and develop. Strong emphasis is given to understanding the economic problems facing developing nations.
- AEEC 540. Econometrics I 3 cr.
An integration of quantitative and statistical techniques for research and management in economics and business. Prerequisite(s): ECON 457 and ECON 405 or A ST 505.
- AEEC 545. Advanced Agricultural Policy 3 cr.
Historical and cultural background of food and agricultural policy in the United States. Analysis of food and agricultural problems, policy-making and implementation. Economic evaluation of specific U.S. food and agricultural policy instruments, their domestic and international impacts. Same as AG E 445V with additional work required at the graduate level. Cannot receive credit for both AG E 445V and AEEC 545. Prerequisite: consent of instructor.
- AEEC 550. Advanced Microcomputer Applications in Agriculture 3 cr. (2+2P)
An advanced course in electronic spreadsheets and the concepts and tools of database management emphasizing agricultural applications. Prerequisites: AG E 250, C S 110G or consent of instructor. Taught with AG E 450 with additional work required at the graduate level. Cannot receive credit for both AG E 450 and AEEC 550.
- AEEC 551. Advanced Agribusiness Marketing 3 cr.
Applications course in which self-managed teams apply marketing theory in the development and presentation of marketing plans for food and agribusiness firms. Course includes analysis of marketing problems with emphasis on strategic marketing issues changing trade policies, and global competitiveness. Prerequisite: consent of instructor.
- AEEC 556. Advanced Agribusiness Management 3 cr.
Integration of production, marketing, accounting, finance, agricultural policy, human behavior, and business environment concepts in management of agricultural businesses using a decision case approach.
- AEEC 575. Advanced Water Resource Management and Policy 3 cr.
Integrating natural and social sciences, analytical methods, and critical reasoning skills to evaluate water resource issues. Extensive use of data and numerical techniques applied to a variety of water resource topics. Familiarity with MS Excel or similar software desirable. Same as AG E 475, with additional work required at graduate level.
- AEEC 580. Natural Resources and Environmental Policy 3 cr.
Surveys and analyzes natural resource and environmental policy, both domestic and global, in terms of content and context, policy, processes, policy models, levels of government, and values and ethical positions. Includes public lands policies, private property issues, air and water quality, waste disposal, energy and sustainable development with emphasis on natural resources and agriculture.
- AEEC 585. Production Economics 3 cr.
Application of microeconomic theory to problems and decisions of food and agricultural firms. The theoretical foundation of production economics and the theory of the firm are developed. Prerequisites: MATH 142G, ECON 371, and ECON 457.
- AEEC 589. Global Agribusiness Environment 3 cr.
Covers the integration of free trade, social equity, environmental and transnational corporation's aspects of agribusiness from a food and global market perspective and within the framework of open systems theory, the socio-ecological perspective (OSTE). Prerequisite: Graduate students only.
- AEEC 590. Special Topics 3 cr.
Seminars in selected current topics in the various areas of agricultural economics and economics. Offerings will carry a subtitle. Prerequisite: consent of instructor.
- AEEC 591. Agribusiness Management Seminar 1 cr.
One agribusiness topic or firm will be investigated in depth each semester. Production, marketing, accounting, finance, policy, and/or business environment issues will be emphasized. Prerequisite: Consent of instructor. May be repeated for a maximum of 4 credits.
- AEEC 593. Internship 1-6 cr.
Supervised professional on-the-job training experience in policy analysis.
- AEEC 594. Internship 1-6 cr.
One semester to six months internship with a regulated firm or public utility commission. A faculty member will direct and evaluate the internship. For AEEC regulatory option students only.
- AEEC 595. Internship 1-6 cr.
Supervised professional on-the-job learning experience. Limited to Master of Agriculture candidates. No more than 6 credits toward a degree.
- AEEC 596. Individual Study 1-3 cr.
Individual study programs. Each offering will carry a subtitle. Maximum of 3 credits in a semester and 6 credits in a program. Prerequisite: consent of instructor.
- AEEC 597. Non-Thesis Research Project 1-3 cr.
Individual investigations, either analytical or experimental. Maximum of 3 credits per semester. No more than 3 credits toward a degree.
- AEEC 598. Creative Component Project 3-6 cr.
Individual investigations, either analytical or experimental. A minimum of 3 to 6 credits per semester. No more than 6 credits toward degree. Consent of instructor required. Prerequisite(s): Consent of Instructor. Restricted to AEEC majors.
- AEEC 599. Master's Thesis 0-88 cr.
Thesis.

ECONOMICS

Descriptions for the following courses may be found under the section "Economics and International Business" later in this chapter.

ECON 450V. International Economics	3 cr.
ECON 453. Introduction to Health Services Policy	3 cr.
ECON 455. Public Utilities Regulation	3 cr.
ECON 457. Mathematical Economics	3 cr.
ECON 458. Development of Economic Thought	3 cr.
ECON 460. Intelligence Research and Analysis	3 cr.
ECON 465. Economics of Human Resources	3 cr.
ECON 489. Senior Economics Seminar	3 cr.
ECON 490. Selected Topics	1-3 cr.
ECON 498. Independent Study	1-3 cr.
ECON 503. Managerial Economics	3 cr.
ECON 545. Econometrics II	3 cr.
ECON 550. Special Topics	1-3 cr.
ECON 571. Regulatory Policy and Industry Analysis: Electricity I	3 cr.
ECON 572. Regulatory Policy and Industrial Analysis: Water and Natural Gas	3 cr.
ECON 573. Regulatory Policy and Industry Analysis: Electricity II	3 cr.
ECON 574. Advanced Seminar Regulatory Policy and Industry Analysis	3 cr.
ECON 581. International Economics	3 cr.
ECON 582. Economics of Health Care	3 cr.

DEGREE: Master of Agriculture
SPECIALIZATION: Domestic Animal Biology

DEGREE: Master of Science
MAJOR: Animal Science

DEGREE: Doctor of Philosophy
MAJOR: Animal Science

DEGREE: Master of Science
MAJOR: Range Science

DEGREE: Doctor of Philosophy
MAJOR: Range Science

MINOR: Animal Science
MINOR: Range Science

The Department of Animal and Range Sciences offers graduate work leading to the Master of Science and the Doctor of Philosophy degrees with majors in animal science and range science. The Doctor of Philosophy degree in animal science is only in the areas of reproductive physiology or ruminant nutrition.

Prerequisite for admission as a regular graduate student in the department is the completion of a curriculum, substantially equivalent to that required of undergraduate students in animal or range science at this institution, 3.0 GPA, and three letters of reference.

For the Master of Science degree, a minimum of 30 semester credits of graduate work in the major and related subjects will be required, together with a thesis for most majors. A non-thesis option is available for certain students.

For the Master of Agriculture with specialization in Domestic Animal Biology, students must complete 32 credit hours of graduate courses which include 2 credits of ANSC 598 for the creative component.

The Doctor of Philosophy student must demonstrate proficiency in a foreign language or research tool, such as experimental statistics, philosophy of science, computer science, or mathematics. Choice of the research tool will remain the option of the student subject to approval by the student's graduate committee. Demonstration of proficiency may be accomplished by satisfactory completion of courses or by other suitable evidence acceptable to the student's committee. In addition, doctoral students are required to complete advanced courses in a field of study closely related to animal science or range science. The number of courses to be completed in the related area will be determined by the student's committee. Related areas of study often are biology, chemistry, or experimental statistics.

Graduate work in the department is designed to prepare the student for work in the fields of research, extension, teaching, production, and conservation.

Facilities available to graduate students include herds and flocks of the major livestock species, animal nutrition laboratories, physiology laboratories, meats laboratory, small animal laboratory, 25,000-specimen herbarium, two ranches of approximately 92,000 acres, and a 1,000-head experimental feedlot. Active cooperation is maintained with federal research agencies located on and off the campus.

A number of graduate assistantships will be available each year. Inquiries should be addressed to the head of the department.

ANIMAL SCIENCE

ANSC 458. Livestock Behavior, Welfare and Handling	3 cr. (2+3P)
Principles of animal behavior and evaluation of management practices on animal welfare in confined and rangeland livestock operations. Low stress livestock handling techniques. Design of livestock handling facilities. Prerequisite(s): RGSC 294 or ANSC 100. Crosslisted with: RGSC 458	
ANSC 462. Parasitology	3 cr.
Same as EPWS 462.	
ANSC 462 L. Parasitology Lab	1 cr.
Classification, biological effects, and management of animal parasites of man, domestic animals, and wildlife. One-hour lab is optional. Same as EPWS 462.	
ANSC 468. Advanced Dairy Herd Management	3 cr.
The course is offered through the Southern Great Plains Dairy Consortium in Clovis, NM, and will include breeding, nutrition, physiology, health and management of large herd dairies of the Southwest. Students must apply for the course through the Consortium, and can take it more than once, as	

ANIMAL AND RANGE SCIENCES

Department website: <http://anrs.nmsu.edu>

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tross@nmsu.edu

T. T. Ross, interim department head, Ph.D. (North Carolina State-Raleigh)—physiology of reproduction and sheep production; L. B. Abbott, Ph.D. (University of Arizona)—range ecology; K. W. Allred, Ph.D. (Texas A&M)—plant taxonomy; R.L. Ashley, Ph.D. (Colorado State University) physiology of reproduction; D.W. Bailey, Ph.D. (Colorado State)—rangeland management; A.F. Cibils (Colorado State)—grazing management and ecology; G.M. Fassenko, Ph.D. (North Carolina State University) companion animal managment; A. G. Fernald, Ph.D. (Colorado State)—land use hydrology and water quality hydrology; D. M. Halford, Ph.D. (Oklahoma State)—physiology of reproduction; J. L. Holechek, Ph.D. (Oregon State)—range ecology; S. L. Lodge-Ivey, Ph.D. (New Mexico State)- ruminant nutrition/microbiology; C. A. Löest, Ph.D. (Kansas State)—ruminant nutrition; K. C. McDaniel, Ph.D. (Texas A&M)—brush management; E.J. Scholljegerdes, Ph.D. (University of Wyoming) ruminant nutrition; S. Soto-Navarro, Ph.D. (New Mexico State) ruminant nutrition; J. D. Thomas, Ph.D. (University of Missouri-Columbia)—meat science; M. G. Thomas, Ph.D. (Texas A&M)—physiology of reproduction; J. L. Turner, Ph.D. (Kansas State)—equine immunology and physiology; M. W. Wise, Ph.D. (University of Nebraska)—physiology of reproduction.

Adjunct faculty: C.D. Allison, Ph.D. (Texas A&M) range management; D.N. Anderson, Ph.D. (Texas A&M) animal behavior; J. Barrow, Ph.D. (Washington State) plant genetics; R.L. Byford, Ph.D. (Oklahoma State University) veterinary entomology; K. M. Harvstad, Ph.D. (Utah State) range animal nutrition; J.E. Herrick, Ph.D. (Ohio State) soils; D.P. Peters, Ph.D., (Colorado State) landscape ecology; M. K. Wood, Ph.D. (Texas A&M)—range watershed management

- topics vary. Consent of instructor required. Prerequisite(s): ANSC 304.
- ANSC 480. Environmental Physiology of Domestic Animals 3 cr.
Influence of environmental factors on physiological processes of domestic animals. Prerequisite: ANSC 370.
- ANSC 484. Ruminant Nutrition 3 cr.
Energy, nitrogen, and mineral nutrition of ruminants with special emphasis on digestive physiology and metabolism of nonprotein nitrogen compounds. Prerequisite: ANSC 422.
- ANSC 485. Advanced Animal Breeding 3 cr.
Population genetics, heritability, selection, gene x environment and gene x gene interactions, composite development, molecular genetic technology and manipulation. Prerequisite: ANSC 423 and A ST 311.
- ANSC 501. Advanced Animal Nutrition (so) 3 cr.
Emphasis on digestive physiology and metabolism. Basic mechanisms involved in the intake, digestion, and absorption of nutrients studied. Prerequisite: CHEM 211 or consent of instructor. Same as HNDS 501.
- ANSC 504. Animal Physiology Techniques (se) 4 cr.
Radioimmunoassay procedures. Methods and procedures for conducting reproductive physiology research in livestock. Includes animal preparation, sample collection, laboratory and cell culture procedures. Prerequisite: consent of instructor.
- ANSC 507. Laboratory Techniques in Nutrition (f) 4 cr. (2+6P)
Methodology and experimental procedures in measuring nutrient requirements and value of diets. Prerequisites: ANSC 422 and CHEM 321 or consent of instructor. Same as HNDS 507.
- ANSC 509. Endocrinology of Domestic Animals (f) 3 cr.
The role of hormones in growth, development, metabolism, temperature regulation, lactation, and reproduction of domestic animals, including commercial applications.
- ANSC 510. Range Nutrition Techniques (se) 3 cr.
Animal and plant methods of determining quantity and quality of range forage. Prerequisite: ANSC 484 or consent of instructor. Same as RGSC 510.
- ANSC 512. Research Methods in Animal Science (s) 4 cr. (3+2P)
Procedures used in animal science research, including planning and conduct of investigations and interpretation of results. Same as HNDS 512.
- ANSC 515. Graduate Seminar 1 cr.
Current topics. Same as HNDS 517.
- ANSC 520. Advanced Nutritional Management I: Feedlot (se) 3 cr.
Emphasis on feeding systems for beef cattle from weaning to slaughter. Primary focus on feedlot nutrition and management. Prerequisite: ANSC 484 or consent of instructor.
- ANSC 521. Advanced Nutritional Management II: Cow Calf/Stockler (so) 3 cr.
Emphasis on nutritional management for cow-calf and stocker operations. Primary focus on applications to range animal nutrition and management. Prerequisite: ANSC 484 or consent of instructor.
- ANSC 522. Animal Nutrition (f) 3 cr.
Nutrient utilization and measurement; nutrient requirements for the various body functions. Taught with ANSC 422 and same as HNDS 522 with additional requirements for graduate students. Recommended for nonmajors. Prerequisite(s): CHEM 211. Crosslisted with: HNDS 522
- ANSC 550. Special Topics 1-4 cr.
Specific subjects to be announced in the Schedule of Classes. Maximum of 4 credits per semester. No more than 9 credits toward a degree.
- ANSC 560. Rumen Microbiology (so) 3 cr.
Issues in ruminal and gastrointestinal microbiology. Includes physiological and genetic mechanisms in carbohydrate and nitrogen utilization. Prerequisites: ANSC/HNDS 501 and CHEM 546. Same as FSTE 560.
- ANSC 598. Special Research Programs 1-4 cr.
Individual investigations, either analytical or experimental. Maximum of 4 credits per semester. No more than 6 credits toward a degree.
- ANSC 599. Master's Thesis 0-88 cr.
Thesis.
- ANSC 600. Research 1-88 cr.
ANSC 602. Advanced Reproductive Physiology (fo) 3 cr. (22P) Mechanisms of reproductive function; research methodology. Prerequisite: ANSC 421 or consent of instructor.
- ANSC 602. Advanced Reproductive Physiology (fo) 3 cr. (2+2P)
Mechanisms of reproductive function; research methodology. Prerequisite: ANSC 421 or consent of instructor.
- ANSC 602 L. Molecular Techniques in Reproductive Physiology (fo) 2 cr. (4P)
Molecular biology techniques used in the study of reproductive physiology in domestic animals. Extraction of RNA, DNA from endocrine tissues, northern analysis, culture of pituitary/ovarian tissue. Mechanisms of hormone action. Prerequisite: consent of instructor.
- ANSC 603. Cardiovascular and Neural Physiology (so) 3 cr.
Anatomical and physiological considerations of the cardiovascular and nervous systems of domestic animals; interactions between these systems and how they elicit control over various body functions. Prerequisite: ANSC 370.
- ANSC 604. Hypothalamo-Hypophyseal-Pineal Endocrinology (fe) 1 cr.
Hormones and other neurochemicals synthesized and secreted by the hypothalamus, pituitary, and pineal glands. Neuroendocrinology of the hypothalamo-hypophyseal axis. Prerequisite: ANSC 509.
- ANSC 605. Gonadal and Uterine Endocrinology (fe) 1 cr.
Endocrinology of mammalian ovaries, testes, and uteri including developing trophoblasts. Prerequisite: ANSC 509.
- ANSC 606. Endocrinology of Pregnancy, Parturition, and Lactation (fe) 1 cr.
Hormones and other chemical messengers involved in maintenance of pregnancy, control of parturition, and initiation and maintenance of lactation in farm animals. Prerequisite: ANSC 509.
- ANSC 621. Metabolic Functions and Dysfunctions (fe) 3 cr.
Physiological chemistry of ruminants and other domestic animals, with attention to metabolic dysfunctions and nutritional toxicology. Prerequisites: CHEM 345 and ANSC 501. Same as HNDS 621.
- ANSC 625. Nutrient Metabolism I: Mineral, Vitamin, and Nitrogen Metabolism (fo) 4 cr.
Cellular metabolism, physiological function(s), toxicities, and deficiencies of minerals, vitamins and nitrogen in ruminants and nonruminants. Prerequisite: ANSC/HNDS 501. Same as HNDS 625.
- ANSC 626. Nutrient Metabolism II: Carbohydrates, Lipids, and Energetics (se) 4 cr.
Basic principles of carbohydrate, lipid, and energy metabolism; integration of metabolism with emphasis on nutritional and biochemical processes related to efficiency of nutrient use. Prerequisite: ANSC 501 or HNDS 501. Same as HNDS 626.
- ANSC 650. Special Topics 1-4 cr.
Specific subjects and credits to be announced in the Schedule of Classes.
- ANSC 698. Special Research Programs 1-4 cr.
Advanced individual investigations, either analytical or experimental. Maximum of 4 credits per semester. No more than 6 credits toward a degree.
- ANSC 700. Doctoral Dissertation 0-88 cr.
Dissertation.

RANGE SCIENCE

- RGSC 452. Rangeland Analysis 4 cr. (2+4P)
Analysis methods used to determine structure and function of rangelands and their applications to rangeland management and assessment. Prerequisites: RGSC 294 and A ST 311.
- RGSC 458. Livestock Behavior, Welfare and Handling 3 cr. (2+3P)
Principles of animal behavior and evaluation of management practices on animal welfare in confined and rangeland livestock operations. Low stress livestock handling techniques. Design of livestock handling facilities. Prerequisite(s): RGSC 294 or ANSC 100. Crosslisted with: ANSC 458
- RGSC 460. Advanced Rangeland Management 4 cr. (3+3P)
Rangeland survey methods; rangeland management plans; problems of rangeland administration; cooperation in rangeland improvement programs. Prerequisites: RGSC 294, RGSC 440, and RGSC 452.
- RGSC 509. Approaches to Rangeland Research 3 cr.
Techniques and methods of conducting rangeland and ecological research. Review of pertinent literature with analysis of experimental results. Prerequisites: A ST 505 or consent of instructor.
- RGSC 510. Range Nutrition Techniques 3 cr.
Same as ANSC 510.
- RGSC 513. Advanced Rangeland Ecology 3 cr.
Overview of the current state of knowledge in selected areas of rangeland ecology, with emphasis on currently developing ideas and issues relevant to rangeland management. Prerequisite(s): RGSC 440 or equivalent.
- RGSC 515. Graduate Seminar 1 cr.
Current topics. Graded S/U.
- RGSC 516. Rangeland Ecosystem Management 3 cr.
Survey of seminal and current literature in range science as an applied discipline. Includes a broad overview of interdisciplinary topics such as rangeland climates, soils, plant eco-physiology, plant community ecology, hydrology, and livestock grazing management. Applications of range science to the sustainable management of rangeland ecosystems will be emphasized.
- RGSC 518. Watershed Methods and Management 3 cr.
Management of rangeland and forest watersheds with emphasis on the hydrologic cycle and land use effects on runoff and water quality. Hydro-

logic monitoring methods problem sets required for graduate credit.	
RGSC 520. Rangeland Animal Ecology	3 cr.
Rangeland animal nutrition, behavior, and social interactions with special emphasis on rangeland animal responses to plants with antiquality compounds.	
RGSC 525. Advanced Rangeland Restoration Ecology	3 cr.
Principles and practices of vegetation management and ecological restoration. Course emphasizes problems associated with rangeland degradation, and implementation of rangeland restoration and improvements. Research paper required for graduate credit.	
RGSC 550. Special Topics	1-4 cr.
Specific subjects to be announced in the Schedule of Classes. Maximum of 4 credits per semester. No more than 9 credits toward a degree.	
RGSC 598. Special Research Program	1-4 cr.
Individual investigations, either analytical or experimental. Maximum of 4 credits per semester. No more than 6 credits toward a degree.	
RGSC 599. Master's Thesis	0-88 cr.
Thesis.	
RGSC 600. Doctoral Research	1-88 cr.
Research.	
RGSC 611. Principles and Evaluation of Rangeland Restoration	3 cr.
Soil-plant-animal-weather relations affecting improvement practices and management of the rangeland ecosystem. Prerequisite: consent of instructor.	
RGSC 630. Quantitative Plant Ecology	3 cr.
Applications of quantitative, analytical techniques used to describe and assess rangeland plant communities. Prerequisites: RGSC 440 and A ST 505 or equivalent.	
RGSC 650. Special Topics	1-4 cr.
Specific subjects to be announced in the Schedule of Classes. Maximum of 4 credits per semester. No more than 9 credits toward a degree.	
RGSC 698. Special Research Programs	1-4 cr.
Advanced individual investigations, either analytical or experimental. Maximum of 4 credits per semester. No more than 6 credits toward a degree.	
RGSC 700. Doctoral Dissertation	0-88 cr.
Dissertation.	

ENTOMOLOGY, PLANT PATHOLOGY, AND WEED SCIENCE

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Jill Schroeder, interim department head, Ph.D. (Georgia)-weed science; R. N. Arnold, M.S. (New Mexico State)-weed science; J. Ashigh, Ph.D. (Guelph)-weed science; C. S. Bundy, Ph.D. (Georgia) entomology; R. L. Byford, Ph.D. (Oklahoma State)-veterinary entomology; R. Creamer, Ph.D. (California-Davis)-plant pathology; J. J. Ellington, Ph.D. (Cornell)-entomology; N.P. Goldberg, Ph.D. (Arizona)-plant pathology; T. R. Grasswitz, Ph.D. (California-Riverside)-IPM specialist; S. Hanson, Ph.D. (University of Wisconsin)-molecular plant pathology; J. D. Kemp, Ph.D. (California-Los Angeles)-plant genetics; H. G. Kinzer, Ph.D. (Oklahoma State)-veterinary entomology; B. E. Lewis, M.S. (New Mexico State)-economic entomology; J. Breen Pierce (Rutgers)-entomology; S. Sanogo, Ph.D. (Pennsylvania State)-plant pathology; C. A. Sutherland, Ph.D. (Oregon State)-extension entomology; S. H. Thomas, Ph.D. (Iowa State)-nematology; D.C. Thompson, Ph.D. (Colorado State)- entomology.

DEGREE: Master of Science
MAJOR: Agricultural Biology

MINOR: Agricultural Biology

The complexity of managing insects, plant diseases, and weeds is increasing environmental concerns, costs, and regulations necessitate an integrated approach to management strategies. Future professionals in integrated pest management will be ecologically oriented, trained to manipulate biological and cultural technologies while minimizing chemical control options. The Master of Science degree program in agricultural biology is designed to produce graduates with the academic and research background needed to facilitate effective, innovative, and environmentally sound protection of plants and animals from

a wide and varied spectrum of pests. Students will be prepared for careers in research, extension, teaching, private consulting, industry, and government or to continue in a broad range of Ph.D. programs. Specific opportunities will include positions as agricultural consultants, technical and sales representatives for industry, state departments of agriculture and USDA specialists, agricultural extension agents, and industry research and environmental technicians. There is currently a strong need for M.S. graduates trained in these areas, and the demand is expected to increase dramatically.

Students may wish to concentrate their graduate program in entomology, plant pathology, or weed science, or conversely may wish to be broadly trained in all three pest-management disciplines. Most students will be expected to complete a thesis. A nonthesis option is available, depending on prior training and experience and subject to approval by the department head. A nonthesis research option requires completion of a research paper, suitable as judged by the student's graduate committee, for journal publication. Completion of an undergraduate degree essentially equivalent to that offered by the department is required for admission to the M.S. graduate program. Qualifications for admission will be reviewed by the departmental Graduate Admissions committee. Prospective graduate students must have at least a 3.0 undergraduate GPA, complete the GRE, and submit an official transcript, a letter of intent, and three letters of recommendation.

ENTOMOLOGY, PLANT PATHOLOGY, AND WEED SCIENCE

EPWS 451. Special Topics	1-4 cr.
Specific subjects and credits to be announced in the Schedule of Classes. Maximum of 4 credits per semester and a grand total of 9 credits. Prerequisite: consent of instructor.	
EPWS 452. Applied Pesticide Toxicology	3 cr.
Classification, mode of action, and use of insecticides and related pesticides.	
EPWS 455. Advanced Integrated Pest Management	3 cr.
Examination of factors affecting the biology and ecology, population evaluations, and control of insect, disease, and weed pests with an emphasis on integrating management practices. Credit cannot be given for both EPWS 455 and EPWS 505. Prerequisite: either EPWS 303, EPWS 310, EPWS 311, or consent of instructor.	
EPWS 456. Biological Control	3 cr.
Principles of plant and animal suppression using living organisms. Interaction of biological control organisms with biotic and abiotic factors will be stressed. Credit cannot be given for both EPWS 456 and EPWS 506. Prerequisite: introductory course in entomology.	
EPWS 462. Parasitology	3 cr.
Introduction to classification, biology, ecology and management of the major parasites of human, domestic animals and wildlife.	
EPWS 462 L. Parasitology Lab	1 cr.
Methods of collecting and identifying the major parasites of humans, domestic animals and wildlife. Concurrent enrollment in EPWS 462 is desirable.	
EPWS 471. Plant Mineral Nutrition	3 cr.
Same as HORT 471 and AGRO 471.	
EPWS 481. Plant Nematology	3 cr. (2+2P)
Biology, ecology and basic identification of soil-inhabiting nematodes, with emphasis on host-parasite relationships and management principles for plant-parasitic genera.	
EPWS 486. Plant Virology	3 cr.
An overview of viral pathogens associated with infectious plant disease. Includes pathogens, replication, genetics, transmission, and movement of plant viruses.	
EPWS 491. Insect Physiology	3 cr.
Metabolism of carbohydrates, amino acids, lipids, and vitamins. Physiology of development, reproduction, pheromone and sensory reception. Prerequisites: EPWS 303 or BIOL 433, CHEM 211, or consent of instructor.	
EPWS 492. Diagnosing Plant Disorders	3 cr. (2+3P)
Systematic diagnosis of the physiological, pathological, and entomological causes of plant disorders. Prerequisites: EPWS 303, EPWS 310. Same as AGRO 492 and HORT 492.	
EPWS 505. Advanced Integrated Pest Management	3 cr.
Examination of the factors affecting the biology and ecology, population evaluations, and control of insect, disease, and weed pests, with an emphasis on integrating management practices. Prerequisite: EPWS 303, EPWS 310, EPWS 311, or consent of instructor. Credit cannot be given for both EPWS 455 and EPWS 505.	

EPWS 506. Biological Control	3 cr.
Principles of plant and animal pest suppression using living organisms. Interaction of biological control organisms with biotic and abiotic factors will be stressed. Individual paper or project required. Prerequisite: introductory course in entomology. Credit cannot be given for both EPWS 456 and EPWS 506.	
EPWS 511. Introduction to Weed Science (f)	4 cr. (3+2P)
Covers the principles of weed science with emphasis on characteristics of invasive plants, methods of integrated weed management, and current issues impacting weed management. Includes identification of local weeds. Research paper required for graduate credit. Prerequisite(s): CHEM 111G and BIOL 211G. Crosslisted with: AGRO 511.	
EPWS 514. Plant Physiology	2 cr.
Overview of photosynthesis, respiration, water relations of plants, minerals and organic nutrition, growth and development. Prerequisites: BIOL 211G, CHEM 112G. Same as BIOL 514.	
EPWS 514 L. Plant Physiology Laboratory	2 cr.
Examination of and laboratory techniques for measurement of plant-water relations, solute transport, mineral nutrition, photosynthesis, enzyme activity, gene expressions, nitrogen metabolism hormone content and function and growth/development. Special project required. Prerequisite: BIOL 314 or EPWS 314. Same as BIOL 514.	
EPWS 520. Environmental Fate of Pesticides (so)	3 cr.
Mechanisms of pesticide movement, degradation, behaviors and persistence in soil, water, and plants. Experimental and analytical techniques. Prerequisites: CHEM 211, EPWS 311, and EPWS 314.	
EPWS 523. Environmental Toxicology	3 cr.
Same as TOX 523.	
EPWS 530. Plant Physiology: Metabolism	3 cr.
Examination of major plant metabolic processes, including photosynthesis, nitrogen metabolism, lipid and secondary plant production metabolism, and how they are related. Prerequisites: BIOL/EPWS 314 and CHEM 314, or consent of instructor. Same as AGRO 530, BIOL 530, HORT 530, and MOLB 530.	
EPWS 549. Special Problems	1-4 cr.
Individual investigation in specific areas of entomology, plant pathology, and weed science. Maximum of 4 credits per semester and a total of 6 credits.	
EPWS 551. Special Topics	1-4 cr.
Specific subjects and credits to be announced in the Schedule of Classes. Maximum of 4 credits per semester. No more than 9 credits toward a degree.	
EPWS 573. Fungal Biology	3 cr. (2+2P)
Introduction to the taxonomy, morphology, physiology, and ecology of fungi. Prerequisite: EPWS 310 or consent of instructor. Same as BIOL 573.	
EPWS 590. Graduate Seminar	1 cr.
Review of current scientific literature in entomology, plant pathology, and weed science, and verbal presentation of information. No more than 2 credits toward a degree.	
EPWS 598. Graduate Internship	1-6 cr.
Supervised professional on-the-job learning experience. Limited to Master of Agriculture candidates. Not more than 6 credits toward the degree.	
EPWS 599. Master's Thesis	0-88 cr.
Thesis.	

FAMILY AND CONSUMER SCIENCES

Department website: <http://aces.nmsu.edu/academics/fcs/>
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E. Devall, interim department head ; M. F. Abdul- Rahman, Ph.D. (Ohio State)- family resource management; S. Bartley, Ph.D. (Tennessee)- family studies; G. Blanch, Ph.D. (Claremont)-education; P. Bloomquist, Ph.D. (New Mexico State)- education management and development; M. Bock, Ph.D. (Kansas State)-foods and nutrition; M. Chavez, Ph.D. (New Mexico State)- educational management; D. DelCampo, Ph.D. (Michigan)-family and child development; R. DelCampo, Ph.D. (Florida State)-family and child development; E. Devall, Ph.D. (Georgia)- child and family development; W. Eastman, Ph.D. (Texas Woman's)-nutrition and food service systems management; W. Fedio, Ph.D. (University of Alberta-Canada)-food microbiology; N. Flores, Ph.D. (Kansas State)-food science; J. Green, Ed.D. (New Mexico State)education administration; W. Hamilton, Ed.D. (Montana State)-adult education and administration. U. Krishnan, Ph.D. (Ohio

State)-human development; K. Mandabach, Ed.D. (Houston)-higher education cultural and historical studies; S. McDowall, Ph.D. (Kansas State) food service and hospitality management; L. McKee, Ph.D. (Texas Tech)-food science and nutrition; M. Montanez, Ph.D. (Michigan State)-developmental psychology; R. Smitley, Ph.D. (Texas Woman's)-clothing, textiles, and fashion merchandising; B. Stringam, Ph.D. (University of Northern Arizona)- education; C. Turner, Ph.D. (New Mexico State)-curriculum and instruction; K. Vaillancourt, Ph.D. (Virginia Tech)-family studies.

DEGREE: Master of Science MAJOR: Family and Consumer Sciences

MINOR: Family and Consumer Science

The candidate for the master's degree should have an undergraduate degree in a field related to the intended area of specialization. In addition to the Graduate School requirements, the admissions criteria for the Department of Family and Consumer Sciences Graduate Program include letters of reference, standardized test scores, and other materials. Suggested departmental deadlines for review of admission materials are six weeks prior to the first day of the semester of desired start. A complete description of admission requirements should be obtained from the department. The Master of Science degree in Family and Consumer Sciences can be obtained with an emphasis in one of the following areas: hotel, restaurant and tourism management; clothing, textiles and fashion merchandising; family and child science (marriage and family therapy emphasis or teaching and research emphasis); human nutrition and food sciences; family and consumer sciences education; or general family and consumer science. A minor may be taken in a variety of supporting fields that fit the particular interests of the candidate. A minimum of 30 credits (including 4-6 credits of thesis) is required under the thesis plan and is the recommended program for most students. A non-thesis plan is available. It requires a minimum of 32 credits of course work with a written comprehensive examination. Both plans require a final oral examination.

Students will take, at the graduate level, 3 credits of statistics and 3 credits of research methodology. Students may be required to take a graduate-level technical writing course based on demonstrated writing ability in initial graduate courses. Students who do not have degrees related to their intended areas of specialization may be required to do some leveling work. Prior to the completion of 12 credits, a program advisory committee will be established to determine, with the student, the courses that will be taken for the degree work.

CLOTHING, TEXTILES, AND FASHION MERCHANDISING

CTFM 460. Cultural Perspectives in Dress	3 cr.
Explores the social, psychological and cultural aspects of dress and appearance which includes the relationship of dress to physical and social environments, aesthetic and personal expression and cultural ideas and values. Prerequisite(s): CTFM 255 and CTFM 366.	
CTFM 470. Global Fashion Industry Trends	3 cr.
Exploration of fashion industry trends in a global setting. Current consumer patterns and future trends will be analyzed. Prerequisite(s): Junior, senior, graduate standing, or consent of instructor.	
CTFM 474. Fashion Promotion	3 cr.
Application of media to the communication of clothing information to the public. Prerequisite: CTFM 372 or consent of instructor.	
CTFM 475. Fashion Buying	3 cr.
Fundamental principles and procedures for successful merchandising of fashion goods, responsibilities of buyers, fashion trends, consumer demands, and merchandising arithmetic. Prerequisites: ACCT 251, CTFM 372, and CTFM 474.	
CTFM 476. Apparel Design by Draping	3 cr. (1+4P)
Theory and application of design in various fabrics and styles using three-dimensional forms in solving problems and developing designs. Prerequisite(s): CTFM 255, CTFM 273, CTFM 373. Restricted to CTFM majors.	
CTFM 478. Apparel Design Through Flat Pattern	3 cr.
This course builds upon concepts introduced in Apparel Design by Draping. Examines the process of flat-pattern design and includes an expanded section on design analysis. Consent of instructor required. Prerequisite(s): CTFM 273, CTFM 373, CTFM 476. Restricted to CTFM majors.	
CTFM 489. Fashion Markets	2 cr.
Investigation of fashion merchandising activities through market visits in major fashion centers. Supervised by resident faculty. A report is required. Prerequisite: CTFM 372 or consent of instructor. May be repeated for addi-	

- tional credit.
- CTFM 492. Special Problems 1-4 cr.
Individual research study in a selected subject area of family and consumer sciences. Maximum of 4 credits per semester and a total of 6 credits toward a degree.
- CTFM 551. Socio-Psychological Aspects of Clothing 3 cr.
Analysis of anthropological, political, sociological, and psychological implications of clothing as a communicator.
- CTFM 552. Cultural Perspectives on Dress 3 cr.
Examines dress from interdisciplinary and cross-cultural perspectives. Focus on diversity and social change, the influence of cultural ideals and standards of appearance, and the evolution of dress in response to society's needs, values, and technology. Discussion of cultural perspectives on dress covering European, African, North and South American, Pacific, Asian, and Middle Eastern countries.
- CTFM 571. Textile Science 3 cr. (1+4P)
Fabrics used for modern clothing, furnishings, and miscellaneous end uses. Explores textiles testing procedures. Students enrolling in the 500-level class will be required to complete additional assignments beyond what is required for CTFM 371. Prerequisite: CHEM 110G or consent of instructor.
- CTFM 572. Fashion Merchandising 3 cr.
Covers the apparel industry from designing through manufacturing and distribution to retailers. Students enrolling in the 500-level class will be required to complete additional assignments beyond what is required for CTFM 372. Prerequisites: CTFM 178 and CTFM 255 or consent of instructor.
- CTFM 584. Graduate Study in Clothing for Special Needs 3 cr. (1+4P)
Graduate study in the selection, adaptation, and design of clothing that is functional and attractive for special needs populations such as active sportswear, handicapped, elderly, and various specialty populations. Prerequisites: CTFM 472 and CTFM 476.
- CTFM 590. Special Topics 1-4 cr.
Specific subjects and credits to be announced in the Schedule of Classes. Maximum of 4 credits per semester and a total of 9 credits toward a degree.
- CTFM 598. Special Research Programs 1-4 cr.
Individual investigations, either analytical or experimental. May be repeated for a maximum of 4 credits per semester and no more than 6 credits toward a degree.

FAMILY AND CHILD SCIENCE.

- FCS 449V. Family Ethnicities and Subcultures 3 cr.
Comparative study of American family subsystems with respect to selected social, economic, and cultural backgrounds. Interaction of these subsystems in American society. Differentiated assignments for graduate students.
- FCS 450. Equine Assisted Learning 3 cr.
Covers the complex relationship between horses and humans. Students are introduced to human psychological theories and methods of how people and horses can work together and the application of such structured learning settings using horses to achieve learning outcomes. Students will also be introduced to horsemanship including proper use and maintenance of equipment, safety, handling, basic care, behavior of horses and benefits of the horse. Consent of instructor required.
- FCS 462. Family Communications 3 cr.
Same as COMM 462, W S 462.
- FCS 492. Special Problems 1-4 cr.
Individual research in a selected subject area of family and consumer sciences. Maximum of 4 credits per semester and a total of 6 credits.
- FCS 524. Supervised Practicum 1-9 cr.
Supervised experience in organizations providing services to families and children. Course subtitled in the Schedule of Classes. Prerequisite: consent of instructor. May be repeated for a maximum of 9 credits. Graded S/U.
- FCS 525. Supervised Clinical Practice 3 cr.
Supervised clinical experience in Marriage and Family Therapy. Includes reviews of audio, video, and/or live sessions and case presentations. Prerequisites: 9 credits in Marriage and Family Therapy and consent of instructor. May be repeated for a maximum of 9 credits. Restricted to majors. Graded S/U.
- FCS 546. Adolescent Development and the Family 3 cr.
Advanced study in research and theory relevant to the physical, mental, social, and emotional development of the child, age 12-18. Attitudes, knowledge, and skills related to working with adolescents in the family system. Prerequisite: 3 credits in human development or consent of instructor.
- FCS 547. Infancy and Early Childhood in the Family 3 cr.
Research and theory relevant to prenatal development and the physical, mental, and socio-emotional development of the child from birth to age 5.

- Attitudes, knowledge, and skills needed for working with young children and their families. Prerequisite: 3 credits in human development or consent of instructor.
- FCS 548. The Aging Family 3 cr.
Advanced study in research and theory related to the physical, mental, social, and emotional development of older adults. Attitudes, knowledge, and skills related to working with older adults in the family system, including normative and nonnormative role transitions. Prerequisite: 3 credits in human development or consent of instructor.
- FCS 549. Family Ethnicities and Subcultures 3 cr.
Comparative study of American family subsystems with respect to selected social, economic and cultural backgrounds. Interaction of these subsystems in American society. Students responsible for all requirements for FCS 449V plus additional work. Prerequisite: FCS 585 or consent of instructor.
- FCS 581. Middle Childhood Development in the Family 3 cr.
Research and theory relevant to the physical, mental, and socio-emotional development of the child from ages five to twelve. Attitudes, knowledge, and skills needed for working with school-age children and their families. Prerequisite: three credits in human development or consent of instructor.
- FCS 582. Theories of Marriage and Family Therapy 3 cr.
A balanced study of major theories, research, applications and principles of marriage and family therapy. This course will examine major therapy models and the theories they are derived from as well as the effectiveness of specific therapy models for specific mental health disorders through research. Consent of instructor required.
- FCS 583. Parenting and Child Guidance 3 cr.
Theories, principles, and skills essential for parents and professionals in guiding children within the family system. Problem prevention techniques are stressed. Prerequisites: 3 credits in human development.
- FCS 584. Family Law and Ethics 3 cr.
Study of selected aspects of federal and state laws and ethical issues as they relate to the family system. Prerequisite: either FCS 585 or consent of instructor.
- FCS 585. The Family System 3 cr.
Contemporary family interaction; concepts, composition, resource and environment. Prerequisites: 9 credits in family courses at undergraduate level or consent of instructor.
- FCS 586. Sexuality and Family Dynamics 3 cr.
Psychosocial and physiological aspects of human sexuality from a life span and family systems perspective. Prerequisite: either FCS 585 or consent of instructor.
- FCS 587. Contemporary Marriage and Family Issues 3 cr.
Investigation of one of the following topics each semester: dual career marriages, nontraditional relationships, aged in marriage. Prerequisites: 9 credits in family courses at undergraduate level or consent of instructor.
- FCS 588. Family Mediation 3 cr.
Covers the analysis of the mediation process and psychological issues of divorce. Focus on mediation of custody, visitation, alimony, and property settlements. Prerequisites: FCS 584 and FCS 585, or consent of instructor.
- FCS 589. Family Crises and Rehabilitation 3 cr.
Examination of the major crises experienced by families. Emphasis on family system functioning rather than individual functioning. Preventative measures, positive coping strategies, and therapeutic intervention approaches examined. Prerequisites: 9 credits in family courses at undergraduate level and consent of instructor.
- FCS 590. Special Topics 1-4 cr.
Specific subjects to be announced in the Schedule of Classes. Maximum of 4 credits per semester and a total of 9 credits toward a degree.
- FCS 591. Systemic Integration of Alcohol and Other Drugs (AOD) Issues 3 cr.
Prerequisite: consent of instructor. Same as MSW 591.
- FCS 592. Strategies in Family Therapy 3 cr.
Effective intervention strategies in family therapy practice. Live and taped role plays of interventions for various family problems required. Constructive approaches for working with family systems and third-party payers. Prerequisite: FCS 589 or consent of instructor.
- FCS 598. Special Research Programs 1-4 cr.
Individual investigations either analytical or experimental. Maximum of 4 credits per semester and no more than 6 credits toward a degree.
- FCS 599. Master's Thesis 0-88 cr.
Thesis

FAMILY AND CONSUMER SCIENCES

- FCSC 556. Research Methods 3 cr.
Same as AXED 556.

FCSC 598. Special Research Programs 1-4 cr.
Individual investigations, either analytical or experimental. Maximum of 4 credits per semester and no more than 6 credits toward a degree.

FCSC 599. Master's Thesis 0-88 cr.
May be repeated for unlimited credit, maximum of 6 credits toward a degree.

FAMILY AND CONSUMER SCIENCES EDUCATION

FCSE 492. Special Problems 1-4 cr.
Individual research study in a selected subject area of family and consumer sciences. Maximum of 4 credits per semester and 6 credits toward degree.

FCSE 545. Graduate Study in Vocational Programs for Youth and Adults 3 cr.
Covers vocational education history and programs and ancillary functions of family and consumer sciences. Experience in extension programs and teaching. Additional assignments beyond FCSE 445 required for students registering in FCSE 545.

FCSE 546. Graduate Study in Teaching Methods I 3 cr.
Objectives, content, and organization of family and consumer sciences in high schools; materials and methods of teaching. Additional assignments beyond FCSE 446 required for students registering in FCSE 546.

FCSE 547. Graduate Study in Teaching Methods II 3 cr.
Planning, preparation, and strategies for teaching family and consumer sciences in the secondary schools. Additional assignments beyond FCSE 447 required for students registering in FCSE 547.

FCSE 548. Graduate Study in Supervised Teaching in Family and Consumer Sciences 9 cr.
Seventy of full-time, supervised teaching in selected schools. Additional assignments beyond FCSE 448 required for students registering in FCSE 548. Prerequisite: FCSE 446 or FCSE 546, and consent of instructor. Corequisites: FCSE 447 or FCSE 547.

FCSE 590. Special Topics 1-4 cr.
Specific subjects and credits to be announced in the Schedule of Classes. May be repeated for a maximum of 9 credits toward a degree, 4 credits per semester.

FAMILY RESOURCE MANAGEMENT

FRMG 450. Special Topics 1-4 cr.
Special subjects and credits to be announced in the Schedule of Classes. May be taken for a maximum of 4 credits per semester and a total of 9 credits toward a degree.

FRMG 590. Special Topics 1-4 cr.
Special subjects and credits to be announced in the Schedule of Classes. May be taken for a maximum of 4 credits per semester and a total of 9 credits toward a degree.

HOTEL, RESTAURANT, AND TOURISM MANAGEMENT

HRTM 450. Special Topics 1-4 cr.
Specific subjects to be announced in the Schedule of Classes. Prerequisite: consent of instructor. Maximum of 4 credits per semester and a grand total of 9 credits.

HRTM 492. Special Problems 1-4 cr.
Individual research in a selected subject area of hospitality management. Prerequisite: consent of instructor. Maximum of 4 credits per semester and a total of 6 credits toward a degree.

HRTM 507. Hospitality and Tourism Internship 3 cr.
Supervised placement in a hospitality or tourism organization. An in-depth written report of the experience is required. Prerequisite: consent of instructor. Graded S/U.

HRTM 590. Special Topics 1-4 cr.
Specific subjects and credits to be announced in the Schedule of Classes. Prerequisite: consent of instructor. Maximum of 4 credits per semester and a total of 9 credits toward a degree.

HRTM 598. Special Research Programs 1-4 cr.
Individual investigations, either analytical or experimental. Prerequisite: consent of instructor. Maximum of 4 credits per semester and no more than 6 credits toward a degree.

HRTM 599. Master's Thesis 0-6 cr.
Thesis. Prerequisite: consent of instructor.

FOOD SCIENCE AND TECHNOLOGY

FSTE 520. Graduate Study in Food Microbiology 3 cr. (2+3P)
Detrimental and beneficial microbiological aspects of food products. Methods of quantification and identification of microorganisms associated with food spoilage and preservation. Additional work required at the graduate

level. Prerequisites: BIOL 111G/111L, or BIOL 211G/211L, or BIOL 190, or consent of instructor.

FSTE 521. Graduate Study in Food Chemistry 3 cr.
Comprehensive study of the chemical and physiochemical properties of food constituents. Chemical changes involved in the production, processing and storage of food products and basic techniques used to evaluate chemical and physiochemical properties of foods. Additional work required at the graduate level. Prerequisites: CHEM 111G, CHEM 112G, and CHEM 211, or consent of instructor.

FSTE 526. Graduate Study in Dairy Products Manufacturing 3 cr.
Physical, chemical, microbiological and sensory properties of milk and dairy products. Capstone course which includes a variety of techniques used in previous classes to evaluate milk and dairy products. Additional work required at the graduate level. Prerequisites: FSTE 320, FSTE 325, and HNFS 420, or consent of instructor.

FSTE 530. Graduate Studies in Food Service Organization and Management 3 cr.
Personnel, financial, and general management in institutional and commercial food service operations. Additional work required at the graduate level.

FSTE 531. Food Preservation 3 cr.
Processes used in home and commercial food preservation, including canning, freezing, drying, and irradiation. Same as HNFS 332 with additional work required at the graduate level.

FSTE 547. Experimental Foods 3 cr.
Application of chemical, physical, nutritional and psychological principles and experimental methods to the development and evaluation of foods. Students enrolling in the 500-level class will be required to complete additional assignments beyond what is required for FSTE 447. Prerequisite: FSTE 263G.

FSTE 560. Rumen Microbiology (so) 3 cr.
Same as ANSC 560.

HUMAN NUTRITION AND DIETETIC SCIENCES

HNDS 450. Special Topics 1-4 cr.
Specific subjects and credits to be announced in the Schedule of Classes. Maximum of 4 credits per semester and a grand total of 9 credits.

HNDS 492. Special Problems 1-4 cr.
Individual research study in a selected subject area of family and consumer sciences. Maximum of 4 credits per semester and a total of 8 credits.

HNDS 500. Dietetic Internship Seminar I 1 cr.
Dietetic interns prepare for supervised practice rotations. Topics include professionalism, Code of Ethics, and dietetic internship portfolios. Consent of instructor required. Prerequisite(s): Acceptance into Dietetic Internship program. Restricted to HNFS majors.

HNDS 501. Advanced Animal Nutrition (so) 3 cr.
Prerequisite: CHEM 211 or consent of instructor. Same as ANSC 501.

HNDS 504. Maternal, Infant, and Child Nutrition 3 cr.
Nutritional needs and status during pregnancy, infancy, childhood and adolescence. Application also made to preschool and child care centers. Persons taking graduate-level class will have additional assignments and different grading scale from HNDS 404. Prerequisite: HNDS 251 or consent of instructor.

HNDS 506. Geriatric Nutrition 3 cr.
Nutritional needs, status, and problems of the elderly. Additional work required at the graduate level. Prerequisite: nutrition course or consent of instructor.

HNDS 507. Laboratory Techniques in Nutrition 4 cr. (2+6P)
Methodology and experimental procedures in measuring nutrient requirements and values of diets. Prerequisites: ANSC 422 and CHEM 321, or consent of instructor. Same as ANSC 507.

HNDS 510. Graduate Study in Sports Nutrition 3 cr.
Role of nutrition and nutrients in physical performance of competitive and recreational sports participants. Additional work required at the graduate level. Prerequisites: BIOL 254, BCHE 341, and HNDS 251, or consent of instructor.

HNDS 512. Research Methods in Animal Science 4 cr.
Same as ANSC 512.

HNDS 516. Nutrition and Culture 3 cr.
Cultural aspects of health, food, and nutrition for most ethnic groups of the United States. Covers traditional versus contemporary food habits along with the history and beliefs that influence such habits. Students in this class will be given additional assignments and grading scale will be different from HNDS 416.

HNDS 517. Graduate Seminar 1 cr.
Current topics. Same as ANSC 515. Prerequisite: consent of instructor.

HNDS 522. Animal Nutrition (f) Prerequisite: CHEM 211. Same as ANSC 522.	3 cr.	Prerequisite(s): Acceptance into Dietetic Internship. Restricted to HNFS majors.
HNDS 525. Graduate Study in Food Analysis Covers basic chemical and physical techniques used in establishing nutritional properties and overall acceptance of food products. Additional work required at the graduate level. Prerequisite: CHEM 111G or consent of instructor.	3 cr.	HNDS 590. Special Topics Specific subjects to be announced in the Schedule of Classes. Maximum of 4 credits per semester and a total of 9 credits toward a degree.
HNDS 546. Diet Therapy I Special diets and physiological basis for their use. Laws and regulations concerning the practice of dietetics. Additional assignments beyond HNDS 446 required for students registering in HNDS 546. Prerequisites: BIOL 254, BCHE 341, and HNDS 251, or consent of instructor.	3 cr.	HNDS 598. Special Research Programs Individual investigations either analytical or experimental. Maximum of 4 credits per semester and no more than 6 credits toward a degree.
HNDS 548. Graduate Studies in Advanced Nutrition Covers biochemistry and physiology applied to nutrition. Students enrolled in the 500-level class will be required to complete additional assignments beyond what is required for HNDS 448. Prerequisite(s): BIOL 254, BCHE 341, and HNDS 251, or consent of instructor.	3 cr.	HNDS 621. Metabolic Functions and Dysfunctions Same as ANSC 621.
HNDS 549. Diet Therapy II Continuation of HNDS 546. Prerequisites: HNDS 546 or consent of instructor.	3 cr.	HNDS 625. Nutrient Metabolism I: Mineral, Vitamin, and Nitrogen Metabolism (fo) Same as ANSC 625.
HNDS 551. Graduate Study in Community Nutrition Overview on the practice of community nutrition to include program planning, needs assessment, program implementation and program evaluation. Role of public and private agencies in nutrition programs that impact on nutrition of individuals and groups in the community. Additional work required at the graduate level. Prerequisite: HNFS 350 or consent of instructor.	3 cr.	HNDS 626. Nutrient Metabolism II: Carbohydrates, Lipids, and Energetics (se) Same as ANSC 626.
HNDS 555. Nutritional Toxicology Same as TOX 455 and ANSC 555.	3 cr.	
HNDS 561. Dietetic Internship: Supervised Practice in CES Provides dietetic interns with a minimum of 250 clock hours of supervised practice in Community Nutrition in Cooperative Extension Service settings. Dietetic interns will work under the guidance of faculty and Cooperative Extension Service professionals. Consent of instructor required. Prerequisite(s): Acceptance into Dietetic Internship. Restricted to HNFS majors.	3 cr. (6P)	
HNDS 562. Dietetic Internship: Supervised Practice in Community Nutrition Provides dietetic interns with a minimum of 250 clock hours of supervised practice in community nutrition. Dietetic interns work under the guidance of faculty and community nutrition professionals. Students must complete a total of 3 credit hours of HNFS 562. Consent of instructor required. Prerequisite(s): Acceptance into Dietetic Internship. Restricted to HNFS majors.	1 cr. (2P)	
HNDS 563. Community Nutrition for Dietetic Interns Advanced topics in community nutrition to include conducting community nutrition needs assessments, program planning and grant writing. Consent of instructor required. Prerequisite(s): Acceptance into Dietetic Internship. Restricted to HNFS majors.	3 cr.	
HNDS 564. Dietetic Internship: Supervised Practice in Food Service Management Provides dietetic interns with a minimum of 300 clock hours of supervised practice in food service management. Dietetic interns work under the guidance of faculty and food service management professionals. Students must complete a total of 4 credit hours of HNDS 564. Consent of instructor required. Prerequisite(s): Acceptance into Dietetic Internship. Restricted to HNFS majors.	1 cr. (2P)	
HNDS 565. Foodservice Management for Dietetic Interns Advanced topics in foodservice systems management to include business planning and marketing. Consent of instructor required. Prerequisite(s): Acceptance into Dietetic Internship. Restricted to HNFS majors.	2 cr.	
HNDS 566. Dietetic Internship: Supervised Practice in Clinical Dietetics Provides dietetic interns with a minimum of 500 clock hours of supervised practice in clinical dietetics. Dietetic interns work under the guidance of faculty and dietetics professionals. Consent of instructor required. Prerequisite(s): Acceptance into Dietetic Internship. Restricted to HNFS majors.	6 cr. (12P)	
HNDS 567. Nutrition Care Process for Dietetic Interns Advanced topics in nutrition care process and model to include medical nutrition therapy and evidence-based research and outcomes assessment in clinical dietetics. Consent of instructor required. Prerequisite(s): Acceptance into Dietetic Internship. Restricted to HNFS majors.	3 cr.	
HNDS 568. Dietetic Internship Seminar II Completion of dietetic internship portfolio and preparation for the national registration examination for dietitians. Consent of instructor required.	3 cr.	

FISH, WILDLIFE AND CONSERVATION ECOLOGY

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M. Desmond, interim department head, Ph.D., (Nebraska) avian ecology and conservation; M. Andersen, Ph.D. (Washington)-ecological modeling; W. Boeing, Ph.D. (Louisiana State) - aquatic ecology; J. W. Cain (University of Arizona)- large mammal ecology and management; C. A. Caldwell, Ph.D. (Tennessee)-fish biology; D. E. Cowley, Ph.D. (Wisconsin-Madison)-fish conservation genetics; J. Frey, Ph.D. (University of New Mexico)-ecology and conservation of mammals; G. W. Roemer, Ph.D. (UCLA)-behavioral, population and community ecology and conservation biology; R. Valdez, Ph.D. (Texas A&M)-wildlife ecology;

DEGREE: Master of Science MAJOR: Wildlife Science

The Department of Fish, Wildlife and Conservation Ecology offers graduate work leading to the Master of Science degree with a major in wildlife science. The fishery science major is an option within wildlife science. Faculty members in the department also may advise Ph.D. candidates through the graduate program in the Department of Biology or through the range science program in the Department of Animal and Range Sciences. For additional information please see the graduate catalog entries for the respective departments.

By selecting appropriate courses, the student can meet basic requirements for becoming a Certified Wildlife Biologist and/or a Certified Fisheries Professional.

Minimum qualifications for admission to the graduate program include the following:

- 3.0 grade-point average in the last two years of undergraduate work
- Combined score of 1000 on the verbal and quantitative parts of the Graduate Record Exam (GRE), with at least 450 in each of the two parts
- Course work in zoology, botany, and animal ecology and a basic appreciation of sustainable use of natural resources, with supporting courses in mathematics and written and oral communication.

Applicants should submit a writing sample of approximately 350 words in the form of an essay or letter of application. It should indicate the applicant's reasons for pursuing advanced study, personal and educational goals, and additional experiences (e.g., military or career) or skills that might provide additional preparation for graduate studies. The writing sample should be sent to the department. Three letters of recommendation (or reference forms) should also be submitted to the department (it is preferred that at least two letters come from university instructors) along with GRE scores. Applicants should also contact a faculty member in the department that they would like to work with as an advisor, and that faculty member needs to agree to serve as the students' advisor and fund their research. Application forms, application fee and transcripts should be sent to the Graduate School. Successful applicants will be selected from those who meet the criteria of grade-point average, GRE scores, and educational background described above and who appear to have professional promise as indicated by personal history and written references.

For the Master of Science degree, a minimum of 30 semester credits of graduate work in the major and related subjects is required, together with a the-

sis for most students. Of these credits, at least 15 must be in courses numbered 500 and above, and at least 15 must be for courses with the FWCE prefix. Those programs involving a thesis or research project include 4 to 6 credits of research (FWCE 598 or 599). Students electing a minor are required to take at least 8 credits in the minor field. A nonthesis option is available to some students, depending on prior training and experience, and subject to approval by the advisor and department head.

- All students in the program must complete the following requirements:
- A ST 505 or equivalent
 - one semester of Graduate Seminar (FWCE 515- may be repeated for credit)
 - two courses from the Quantitative Methods category (eligible courses listed below)
 - one course each from the Ecological Concepts, Organismal Biology, and Ecological Techniques categories (eligible courses listed below)
 - 4 to 9 credits from the Independent Study category (eligible courses listed below)

In addition, a student may petition to have up to 3 credits of special topics courses (FWCE 548) apply to one of the three areas.

Quantitative Methods: Eligible courses

A ST 503, SAS Basics	2
A ST 506, Statistical Inference II	3
A ST 507, Advanced Regression	3
A ST 523, Biological Sampling	3
A ST 550, Special Topics	3
FWCE 509, Population Ecology	3
FWCE 522, Research Methods	3
(Other courses, particularly in Applied Statistics, may be eligible with consent of the advisory committee)	

Ecological Concepts: Eligible courses

BIOL 467, Evolution.....	3
BIOL 484, Animal Communications.....	3
BIOL 489, Genetic Aspects of Population Biology.....	3
BIOL 567, Individuals and Populations.....	3
BIOL 568, Communities and Ecosystems.....	3
BIOL 569, Evolutionary Ecology	3
BIOL 570, Ecological Biogeography	3
BIOL 587, Behavioral Ecology	3
FWCE 455, Environmental Risks and Decisions	3
FWCE 488, Conservation Genetics	3
FWCE 459, Aquatic Ecology.....	4
GEOG 557, Biogeography	3

Organismal Biology: Eligible courses

BIOL 547, Advanced Ornithology	4
FWCE 466, Advanced Management of Mammals.....	3
FWCE 482, Ichthyology	4
FWCE 532, Environmental Biology of Fishes	3

Ecological Techniques: Eligible courses

GEOG 487, GIS Practicum	3
GEOG 521, GIS Applications	3
RGSC 452, Rangeland Analysis.....	4
RGSC 518, Watershed Methods and Management.....	3
FWCE 464, Management of Terrestrial and Aquatic Systems	4
FWCE 534, Aquatic Contaminants and Toxicology.....	3

Independent Study: Eligible courses:

FWCE 548, Special Topics.....	up to 3
FWCE 598, Thesis Research.....	4-6
FWCE 599, Thesis	4-6

Graduate work in the department is intended to prepare students for careers in research, teaching, extension, and management. Facilities available to graduate students include two ranches of approximately 90,000 acres, a large suite of shared laboratories, and a 2500 sq ft fish-culture facility. We actively

cooperate with state and federal natural resource management agencies, and graduate students have access to national forests and extensive public lands, as well as the Jornada Basin Long-Term Ecological Research site and associated databases (see <http://jornada-www.nmsu.edu> for details). Additional research opportunities for graduate students are available in the New Mexico Cooperative Fish and Wildlife Research Unit, located in the department since 1988.

Additional information on the graduate program and faculty is available at <http://aces.nmsu.edu/academics/fws>

FISH, WILDLIFE AND CONSERVATION ECOLOGY

FWCE 450. Special Topics	1-4 cr.
Specific subjects and credits as announced in the Schedule of Classes. Maximum of 4 credits per semester and a grand total of 9 credits. Consent of instructor required.	
FWCE 455. Environmental Risks and Decisions	3 cr.
Risk assessment and decision analysis in the context of environmental and conservation issues. Concepts of risk perception and uncertainty; precautionary principle; the roles of experts and stakeholders; the use of conceptual and probabilistic models in risk assessment. Pre/Corequisite(s): MATH 142 or MATH 191G, A ST 311, FWCE 301.	
FWCE 457. Ecological Biometry	3 cr.
Use of ecological data to test scientific hypotheses. Stochastic and statistical models for environmental data, data visualization, likelihood-based and information-based model selection. Emphasis on open-source software tools. Prerequisite(s): MATH 142G or 191G, A ST 311, FWCE 301.	
FWCE 459. Aquatic Ecology	4 cr.
Plant and animal communities in aquatic ecosystems with emphasis on chemical and physical properties, productivity, species interactions, population dynamics, and concepts for diagnosing problems and restoring aquatic ecosystems. Prerequisite(s): FWCE 301 or BIOL 301, CHEM 112G, MATH 142G.	
FWCE 462. Conservation Biology	3 cr.
An examination of the patterns of biological diversity, the processes that generate and maintain it, as well as the forces that are eroding it. Aspects will include the value of biodiversity, factors driving extinction, national and international law and policy. Prerequisite(s): BIOL 111G and BIOL 111L. Pre/Corequisite(s): FWCE 301.	
FWCE 464. Management of Aquatic and Terrestrial Ecosystems	4 cr. (3+2P)
Principles and methods for managing aquatic and terrestrial ecosystems and their fish and wildlife resources. Emphasis on quantitative techniques, data collection and analysis for management of systems at a landscape spatial scale. Prerequisite(s): BIOL 301 or FWCE 301, FWCE 330, A ST 311.	
FWCE 466. Advanced Wildlife Management of Mammals	3 cr.
Ecological principles, production and harvest, habitat management, and techniques of mammal management.	
FWCE 482. Ichthyology	4 cr. (3+2P)
Classification, morphology, identification, life history, and ecology of fishes. Prerequisite(s): FWCE 330 or consent of instructor.	
FWCE 488. Conservation Genetics	3 cr.
Application of evolutionary theory and biotechnologies used in conservation of populations including concepts in population structure, gene flow, inbreeding, hybridization, and forensics. Consent of instructor required. Prerequisite(s): BIOL 305 or AGRO 305.	
FWCE 509. Population Ecology (s)	3 cr. (2+2P)
Quantitative analysis of vital statistics and mechanisms promoting stability in wild populations. Theory and application of life tables and population models.	
FWCE 515. Graduate Seminar	1 cr.
Current topics. May be repeated for unlimited credit.	
FWCE 522. Fishery and Wildlife Research Methods (f)	3 cr.
Methods of research in fishery and wildlife management to include conceptual analysis of research problems; proposal preparation; presentation of results. Prerequisite(s): A ST 461 or consent of instructor.	
FWCE 532. Environmental Biology of Fishes	4 cr. (3+3P)
What makes a fish a fish. Mechanisms of circulation, gas exchange, osmotic and ionic regulation, swimming, migration, reproduction, and chemoreception. Students are responsible for all requirements for FWCE 432 plus additional work.	
FWCE 534. Aquatic Contaminants and Toxicology	4 cr. (3+3P)
Basic principles and methodologies of aquatic toxicity testing. Routes of exposure and modes of action. Environmental legislation and ecological risk assessment. Students are responsible for all requirements for FWCE 434 plus additional work.	

FWCE 535. Special Topics	1-4 cr.
Specific subjects to be announced in the Schedule of Classes. Maximum of 4 credits per semester. No more than 9 credits toward a degree.	
FWCE 536. Advanced Avian Ecology	3 cr.
Focuses on current topics and literature in avian ecology including systematics, mating systems, behavior, physiology, movement patterns and conservation. Includes required overnight field trips. Prerequisite(s): Graduate standing or consent of instructor.	
FWCE 545. Advanced Fish and Wildlife Habitat Management (f)	4 cr. (3+2P)
Principles and methods for managing aquatic and terrestrial habitats for use by fish and wildlife. Quantitative methods and computer programs for evaluating habitats. Field trips and use of computer programs by students are required. Prerequisite: WLSC 522 or consent of instructor.	
FWCE 548. Graduate Problems	1-3 cr.
Individual studies in fishery and wildlife sciences. Maximum of 3 credits per semester. No more than 6 credits of this course and FWCE 598, combined, toward a degree.	
FWCE 558. Nonthesis Project	1-6 cr.
Independent study to satisfy nonthesis project requirement. Maximum of 6 credits toward degree. Available only to nonthesis students.	
FWCE 560. Wildlife Ethology (s)	3 cr.
Comparative vertebrate behavior including social organization, dominance, marking, territoriality, and mother/offspring relationships and their management implications. Introduction to sociobiology. Prerequisite: consent of instructor.	
FWCE 578. Advanced Limnology (s) (a)	3 cr.
Concepts in aquatic production ecology and analytical methods for lake and flowing waters. Prerequisite: consent of instructor.	
FWCE 585. Fish and Wildlife Planning (f)	3 cr.
Covers planning methodologies and concepts for fishery and wildlife professionals.	
FWCE 595. Internship	1-6 cr.
Supervised professional on-the-job learning experience. Limited to Master of Agriculture candidates. No more than 6 credits toward the degree.	
FWCE 598. Special Research Programs	1-3 cr.
Individual investigations, either analytical or experimental. Maximum of 3 credits per semester. No more than 6 credits of this course and FWCE 548, combined, toward a degree. Not available to students in the nonthesis program.	
FWCE 599. Master's Thesis	0-88 cr.
Thesis.	

PLANT AND ENVIRONMENTAL SCIENCES

Department Website: <http://aces.nmsu.edu/pes>
(575) 646-3405
esramire@nmsu.edu

R. Pratt, department head, Ph.D. (Purdue University)- plant genetics; S. Angadi, Ph.D. (University of Manitoba, Canada)-crop physiology; J. Ashigh, Ph.D. (University of Guelph- Ontario)- weed science; B.T. Bestelmeyer, Ph.D. (Colorado State University)-landscape and land use change; P.W. Bosland, Regents Professor, Ph.D. (University of Wisconsin, Madison)-chile breeding and genetics; F. Contreras-Govea, Ph.D. (University of Wisconsin-Madison)-forage production; C. S. Cramer, Ph.D. (North Carolina State University)-onion breeding and horticulture; D. DuBois, Ph.D. (University of Nevada)- atmospheric science; M.C. Dunimay, Ph.D. (New Mexico State University)- agronomy; R. Flynn, Ph.D. (Auburn University)-soil and water quality; R.M. Goss, Ph.D. (University of Nebraska, Lincoln)-turf science; K. Grover, Ph.D. (Pennsylvania State University)- agronomy; S.J. Guldán, Ph.D. (University of Minnesota)-sustainable agriculture; S.F. Hanson, Ph.D. (University of Wisconsin-Madison)-genetics and microbiology; J.T. Harrington, Ph.D. (New Mexico State University)-forest physiology; R.J. Heerema, Ph.D. (University of California, Davis)-pecans; J. Idowu, Ph.D. (Cranfield University, England)- land management; B. Leinauer, Ph.D. (Hohenheim University, Germany)-turfgrass; W. Lindemann, Ph.D. (University of Minnesota)-soil microbiology; K. Lombard, Ph.D. (New Mexico State University)-horticulture; M. Lucero, Ph.D. (New Mexico State University)- molecular biology and toxicology; M. Marsalis, Ph.D. (Texas Tech University)-forages; J.G. Mexal, assistant department head, Ph.D. (Colorado State University)- nursery and forest crops; H.C. Monger, Ph.D. (New Mexico State University) pedology and environmental science; M. Monteros, Ph.D. (University of Georgia, Athens)- plant

breeding and genetics; A. Nalim, Ph.D. (Pennsylvania State University)- plant pathology; G. Niu, Ph.D. (Chiba University, Japan)- horticulture; M.A. O'Connell, Regents Professor, Ph.D. (Cornell University)-plant biochemistry, molecular genetics; M. O'Neill, Ph.D. (University of Arizona)-agronomy; D.P.C. Peters, Ph.D. (Colorado State University)-landscape ecology and simulation modeling; G.A. Picchioni, Ph.D. (University of Texas A&M)-plant-mineral relations; N. Puppala, Ph.D. (New Mexico State University)- agronomy; I.M. Ray, Ph.D. (University of Wisconsin-Madison)-alfalfa breeding and genetics; T.W. Sammis, Ph.D. (University of Arizona)-hydrology; J. Schroeder, Ph.D. (University of Georgia)-weed science; C. Sengupta-Gopalan, Ph.D. (Ohio State University)-biochemical genetics; M.K. Shukla, Ph.D. (University of Agricultural Sciences Vienna, Austria)- environmental soil physics; R. St. Hilaire, Ph.D. (Iowa State University)-plant stress physiology and landscape horticulture; B. Stringam, Ph.D. (Utah State University)- biological and agricultural engineering; C. Steele, Ph.D. (King's College, University of London, United Kingdom); M.E. Uchanski, Ph.D. (University of Illinois at Urbana - Champaign)- vegetable physiology; A.L. Ulery, Ph.D. (University of California, Riverside)- environmental soil chemistry; A. Unc, Ph.D. (University of Guelph, Canada) environmental soil and water microbiology; S. J. Walker, Ph.D. (New Mexico State University)- agronomy; S. Yao, Ph.D. (Cronell University)- pomology/horticulture; J. Zhang, Ph.D. (University of Arkansas)-plant genetics and molecular biology

DEGREE: Master of Science
MAJOR: Horticulture

DEGREE: Master of Science
MAJOR: Plant and Environmental Science

DEGREE: Doctor of Philosophy
MAJOR: Plant and Environmental Science

MINOR: Agronomy
MINOR: Horticulture

More than ever, we are linked in an interconnected world: both in agriculture and sustainability of environmental systems. The department has programs in plant sciences, environmental science, soil science, water management, natural resources management, and turf management. Students trained in these areas are in demand for U.S. and international positions. This demand is at all levels of training—B.S., M.S. and Ph.D. Therefore, the course work and original research in Plant and Environmental Sciences leading to the Master of Science and Doctor of Philosophy are designed for and have proven to be successful in preparing students for commercial companies, educational institutions, governmental agencies, and private production enterprises.

The student may emphasize plant breeding and genetics, environmental and soil science, sustainable crop production, or horticulture. The crop science section places special emphasis on the genetics and improvement of cotton, alfalfa, chile, onions, plant and crop physiology, and genetic engineering. The environmental and soil science section emphasizes environmental quality and ecosystem services, bioremediation, recycling of organic wastes and wastewater, water use efficiency, soil-plant relations, soil-geomorphology and desert ecology, and the fertility, chemistry, physics, and microbiology of soils, including forest soils. The horticulture section emphasizes the creative use of plants by humans, and studies on the technical advancements in the husbandry of most economic commodity groups of fruits, vegetables, or ornamentals as well as managed turf. Emphasis may be in plant breeding and genetics, plant growth and development, nutrition, dormancy and cold hardiness, plant stress (water and/or salinity) response, fruit and vegetable physiology, forestry, and turfgrass.

Most students will be expected to complete a thesis. The research detailed in a thesis should be of a scope and quality to merit publication in a refereed journal. Depending on prior training and experience, a non-thesis option is available subject to approval by a departmental committee. The non-thesis option requires completion of a research project and paper of limited scope. In both the thesis and non-thesis options, suitability of the research project and resulting thesis or paper will be judged by the student's graduate committee. A minor is recommended and may be taken in chemistry, biology, molecular biology, environmental management, experimental statistics, toxicology or other areas.

Prerequisite to major graduate work is completion of a curriculum essentially equivalent to that required by the department for the B.S. degree at New Mexico State University.

Qualifications for admission will be reviewed by the departmental graduate committee. Applications should include a letter of interest. A 3.0 undergraduate grade-point average is recommended for admission to study for the M.S. degree and a 3.3 grade-point average is recommended for Ph.D. studies. Three letters of reference will be required if the student is applying for an assistantship. The department does not require any of the psychometric tests as an admission requirement. Final acceptance requires that a graduate faculty member in the applicant's area of interest accept the student into their program.

A student planning a program leading to a Ph.D. must satisfy one of the following departmental requirements approved by the doctoral committee:

1. A thorough knowledge of a language other than English
2. A reading ability in two foreign languages
3. Reading ability in one foreign language and proficiency with a research tool
4. Reading ability in one foreign language and one semester of supervised teaching experience
5. Proficiency with a research tool and one semester of supervised teaching
6. Two semesters of supervised teaching

A number of graduate assistantships are available each year. Inquiries should be addressed to the department.

AGRONOMY

- AGRO 450. Special Topics 1-4 cr.
Specific subjects to be announced in the Schedule of Classes. Maximum of 4 credits per semester and a total of 9 credits toward a degree.
- AGRO 462. Plant Breeding 3 cr.
Principles and practices involved with the genetic improvement of plants. Prerequisites: ANSC/AGRO/BIOL/HORT 305. Same as HORT 462.
- AGRO 471. Plant Mineral Nutrition 3 cr.
Basic and applied aspects of plant requirements for soil-derived minerals and the processes whereby minerals are acquired, absorbed, translocated, and utilized throughout the plant. Prerequisite: EPWS/BIOL 314, or concurrent enrollment, or consent of instructor. Same as HORT 471 and EPWS 471.
- AGRO 483. Sustainable Production of Agronomic Crops 3 cr. (2+2P)
Characteristics and objectives of sustainable agricultural systems with application to the production, utilization, and improvement of cereal grain, fiber, forage and oilseed crops. Corequisite(s): AGRO 365 or HORT 365.
- AGRO 492. Diagnosing Plant Disorders 3 cr. (2+3P)
Systematic diagnosis of the physiological, pathological, and entomological causes of plant disorders. Prerequisites: EPWS 303 and EPWS 310. Same as EPWS 492 and HORT 492.
- AGRO 500. Special Topics 1-4 cr.
Specific subjects and credits to be announced in the Schedule of Classes. Maximum of 4 credits per semester. No more than 9 credits toward a degree.
- AGRO 505. Research Orientation 3 cr. (2+3P)
Training in writing research proposals, presentation of research results, and interpretation of research results. Same as HORT 505, SOIL 505.
- AGRO 506. Plant Genetics 3 cr.
Advanced treatment of the principles of classical genetics and heredity with emphasis on the nature and action of the gene including molecular analysis. Prerequisite: AGRO 305 or consent of instructor. CHEM 345 recommended. Same as HORT 506.
- AGRO 511. Introduction to Weed Science (f) 4 cr.
Covers the principles of weed science with emphasis on characteristics of invasive plants, methods of integrated weed management, and current issues impacting weed management. Includes identification of local weeds. Research paper required for graduate credit. Prerequisites: CHEM 111G and BIOL 190 or BIOL 211G, or consent of instructor. Same as EPWS 511.
- AGRO 514. Soil-Plant Relationships 3 cr.
Physical, chemical, and biological soil environment as it affects plant and crop growth. Prerequisites: BIOL 314, SOIL 252. Same as HORT 514 and SOIL 514.
- AGRO 515. Crop Physiology 3 cr.
Whole plant physiological processes as related to growth, development, yield, quality and post harvest physiology of crop plants within the environment of the crop community. Prerequisite(s): EPWS/BIOL 314 or consent of instructor. Crosslisted with: HORT 515
- AGRO 516. Molecular Analysis of Complex Traits 3 cr.
Provide a comprehensive overview of molecular genetic analysis of complex phenotypes, including case histories/experiments in plants, animals and humans. Emphasize technological developments in DNA marker technologies and their application to molecular quantitative genetics. Explore the efficient application of these technologies in the future to complex genetic systems, breeding, and other areas of life sciences. Prerequisite: AGRO 305 or consent of instructor. Same as HORT 516.
- AGRO 530. Plant Physiology: Metabolism 3 cr.
Examination of major plant metabolic processes including photosynthesis, nitrogen metabolism, lipid and secondary plant product metabolism and

investigation of how they are related. Emphasis on literature. Same as BIOL 530, EPWS 530, HORT 530, and MOLB 530. Prerequisites: BIOL 314 and CHEM 314, or consent of instructor.

- AGRO 531. Plant Physiology: Growth and Development 3 cr.
Cellular and molecular mechanisms controlling the physiology of maturation and organ development: the roles of environmental stimuli, cell organization, differentiation and phytohormones in regulating these developmental processes. Prerequisite: either BIOL 314, BCHE 341, or BCHE 395. Same as AGRO 531 and BIOL 531. Same as HORT/BIOL 531.
- AGRO 533. Environmental Physiology of Plants 3 cr.
Integral responses of plants and crop productivity to naturally occurring and modified environmental factors such as radiation, temperatures, water vapor, carbon dioxide, and air flow. Prerequisite: BIOL 314 or consent of instructor. Same as BIOL/HORT 533.
- AGRO 585. Plant Cell, Tissue, and Organ Culture 3 cr. (2+3P)
Survey of cell tissue and organ culture techniques with emphasis on applications to asexual gene transfer and crop improvement, including: somaclonal variation, protoplast fusion, recombinant DNA gene transfer, microinjection, totipotency and morphogenesis. Credit will not be given for both HORT/AGRO/BIOL 340 and 585. Background in genetics and biochemistry recommended. Same as HORT/BIOL 585.
- AGRO 590. Graduate Seminar 1 cr.
Review of current scientific literature in agronomy, horticulture, and soil science. Same as HORT/SOIL 590.
- AGRO 595. Internship 1-6 cr.
Supervised professional on-the-job learning experience. Limited to Master of Agriculture candidates. Not more than 6 credits toward the degree. Same as SOIL 595.
- AGRO 597. University Teaching Experience 1-3 cr.
Certain graduate students will be permitted to teach up to one-third of one AGRO/HORT/SOIL/E S course. The student will prepare and deliver lectures and will prepare, administer, and grade at least one examination. The professor in charge of the course will attend and evaluate the student's lectures. Consent of instructor required. Restricted to Agronomy and Horticulture Graduate Students. Crosslisted with: HORT 597 and SOIL 597
- AGRO 598. Special Research Programs 1-6 cr.
Individual investigations, either analytical or experimental. Maximum of 6 credits per semester. No more than 9 credits towards degree. Same as SOIL 598.
- AGRO 599. Master's Thesis 0-88 cr.
Thesis.
- AGRO 600. Doctoral Research 1-88 cr.
Research.
- AGRO 609. Breeding for Plant Disease Resistance 3 cr.
A practically-oriented course of lectures and discussion on concepts and principles of breeding for disease and pest resistance. Labs familiarize students with preparation, quantification, and application of inoculum to hosts. Same as HORT 609.
- AGRO 610. Advanced Crop Breeding 4 cr. (3+3P)
Applications of breeding principles to crop improvement. Emphasis on breeding methodologies using modern techniques, including biotechnology. Prerequisite: AGRO 462 or consent of instructor. Same as HORT 610.
- AGRO 620. Instrumentation in Agronomy 3 cr.
Use of instruments used in research in all areas of agronomy including gas chromatography, high performance liquid chromatography, neutron soil moisture probe, and other instruments. Same as HORT/SOIL 620.
- AGRO 670. Biometrical Genetics and Plant Breeding 3 cr.
A statistical approach to gene action and population parameters as applied to plant improvement. Prerequisite: AGRO 462 or consent of instructor. Same as HORT 670.
- AGRO 685. Plant Genetic Engineering 3 cr.
Analysis of plant genome structure and potential applications of emerging molecular techniques to the genetic improvement of plants. Prerequisites: HORT/AGRO 585 and AGRO/HORT 506 or CHEM 545, or consent of instructor. Same as HORT/BIOL 685.
- AGRO 694. Doctoral Seminar 1 cr.
Current research discussions presented by doctoral level graduate students. Not more than 2 credits toward the degree. Prerequisite: doctoral level graduate students. Same as SOIL 694.
- AGRO 696. Doctoral Proposal 1 cr.
Current research proposal written by doctoral level graduate students. Not more than 1 credits toward the degree. Prerequisite: doctoral level graduate students. Same as SOIL 696.
- AGRO 697. University Teaching Experience 1-3 cr.
Certain graduate students will be permitted to teach up to one-third of one AGRO/HORT/SOIL/E S course. The student will prepare and deliver lectures and will prepare, administer, and grade at least one examination. The professor in charge of the course will attend and evaluate the student's lectures. Consent of instructor required. Crosslisted with: HORT 697 and SOIL 697
- AGRO 698. Topics in Agronomy 1-6 cr.
Topics of current interest, designated by title and credit. Maximum of 6 credits per semester. No more than 9 credits toward a degree.

AGRO 700. Doctoral Dissertation 0-88 cr.
Dissertation.

ENVIRONMENTAL SCIENCE

- E S 450. Epidemiology 3 cr.
Epidemiological approaches to disease prevention and control. Factors influencing health status. Restricted to C HL and ES majors. Crosslisted with: HL S 450
- E S 452. Geohydrology 3 cr.
Origin, occurrence, and movement of fluids in porous media and assessment of aquifer characteristics. Development and conservation of ground water resources, design of well fields. Prerequisite(s): C E 160 or GEOL 111G, and C E 231. Crosslisted with: GEOL 452 and C E 452
- E S 454. Environmental Health 3 cr.
Introduction to environmental health designed to address public health issues. Prerequisite(s): Junior or Senior standing. Restricted to C HL and ES majors. Crosslisted with: HL S 452
- E S 455. Occupational Health 3 cr.
Identification, control, and prevention of occupational diseases and injuries. Prerequisite(s): Junior or senior standing. Restricted to C HL and E S majors. Crosslisted with: HL S 453
- E S 459. Aquatic Ecology 4 cr.
Ecological functions of plant and animal communities in aquatic ecosystems with emphasis on chemical and physical properties, productivity, species interactions, population dynamics, and concepts for diagnosing problems and restoring aquatic ecosystems. Prerequisite(s): (E S, WLSC or BIOL 301), CHEM 112G, (MATH 142G or MATH 191G). Crosslisted with: WLSC 459
- E S 462. Sampling and Analysis of Environmental Contaminants 3 cr. (1-6P)
Theory, application, methodology, and instrumentation used in the sampling and analysis of environmental contaminants. Prerequisites: E S 256. Same as ENVE 462.
- E S 470. Environmental Impacts of Land Use 3 cr.
Capstone course for the environmental science major. Case studies of environmental problems impacting land. Prerequisites: E S 256, E S 462, E S 370.

GENETICS

- GENE 450. Special Topics 1-3 cr.
Specific subjects to be announced in the schedule of classes. Maximum of 3 credits per semester and a total of 3 credits toward a degree. Consent of instructor required.
- GENE 452. Applied Bioinformatics 3 cr.
Survey and application of publicly available bioinformatic tools that treat genomic DNA, cDNA, and protein sequences, RNA abundance, as well as tools that allow inference based on phylogenetic relationships. Prerequisites: AGRO/ANSC/BIOL/HORT 305 or GENE 315 and GENE 320, and BCHE 341, or BCHE 395.
- GENE 486. Genes and Genomes 3 cr.
Extensive coverage of nuclear and organelle genome structure in plants and animals, genome restructuring including duplication, aneuploidy, chromosome translocations and inversions, comparative genomics, and molecular systematics. Prerequisites: AGRO/ANSC/BIOL/HORT 305 or GENE 315, and GENE 320.
- GENE 488. Gene Regulation 3 cr.
Extensive coverage of signal transduction processes and approaches used to monitor large scale changes in gene regulation and protein synthesis that occur during development and in response to environmental changes. Prerequisites: AGRO/ANSC/BIOL/HORT 305 or GENE 315.

HORTICULTURE

- HORT 450. Special Topics 1-4 cr.
Specific subjects as announced in the Schedule of Classes. Maximum of 4 credits per semester and a grand total of 9 credits.
- HORT 462. Plant Breeding 3 cr.
Principles and practices involved with the genetic improvement of plants. Prerequisites: ANSC/AGRO/BIOL/HORT 305. Same as AGRO 462.
- HORT 465. Landscape Case Studies 3 cr. (1-4P)
Application of design principles to case study problems. Prerequisite: HORT 307 or consent of instructor.
- HORT 471. Plant Mineral Nutrition 3 cr.
Basic and applied aspects of plant requirements for soil-derived minerals and the processes whereby minerals are acquired, absorbed, translocated, and utilized throughout the plant. Prerequisite: EPWS/BIOL 314, or concurrent enrollment, or consent of instructor. Same as AGRO/EPWS 471.
- HORT 475. Woody Plant Physiology 3 cr.
Plant physiological processes as related to growth, development and yield of trees or shrubs. Prerequisite: EPWS/BIOL 314, or concurrent enrollment, or consent of instructor.
- HORT 479. Advanced Turfgrass Science 3 cr.
Extensive reviews of turfgrass sciences including ecology, physiology, entomology, pathology, weed science, and soil science. Prerequisite: HORT 378 or consent of instructor.

- HORT 484. Ornamental Plant Production and Management 4 cr. (3+3P)
Covers the principles and practices of greenhouse and nursery crop production and management. Greenhouse irrigation and water quality, fertilization, containers and media, lighting, CO₂ enrichment, growth control, and crop scheduling. Prerequisite: HORT/AGRO 365 or consent of instructor.
- HORT 485. Vegetable Crop Management 4 cr. (3+2P)
Physiological, environmental and cultural aspects of vegetable crop production. Corequisite(s): AGRO 365 or HORT 365, or consent of instructor.
- HORT 488. Greenhouse Management 4 cr. (3+3P)
Principles and practices involved in greenhouse structures and construction, site considerations, covering materials, heating and cooling systems, greenhouse crop production techniques, and case studies. Prerequisite: HORT/AGRO 365 or consent of instructor.
- HORT 492. Diagnosing Plant Disorders 3 cr. (2+3P)
Systematic diagnosis of the physiological, pathological, and entomological causes of plant disorders. Prerequisites: EPWS 303 and EPWS 310. Same as EPWS 492 and AGRO 492.
- HORT 500. Special Topics 1-4 cr.
Specific subjects and credits to be announced in the Schedule of Classes. Maximum of 4 credits per semester. No more than 9 credits toward a degree.
- HORT 505. Research Orientation 3 cr. (2+3P)
Training in writing research proposals, presentation of research results, and interpretation of research results. Same as AGRO/SOIL 505.
- HORT 506. Plant Genetics 3 cr.
Advanced treatment of the principles of classical genetics and heredity with emphasis on the nature and action of the gene including molecular analysis. Prerequisite: AGRO 305 or consent of instructor. CHEM 345 recommended. Same as AGRO 506 and MOLB 506.
- HORT 514. Soil-Plant Relationships 3 cr.
Physical, chemical, and biological soil environment as it affects plant and crop growth. Prerequisites: BIOL 314, SOIL 252. Same as AGRO/SOIL 514.
- HORT 515. Crop Physiology 3 cr.
Whole plant physiological processes as related to growth, development, yield, quality and post harvest physiology of crop plants within the environment of the crop community. Prerequisite(s): EPWS/BIOL 314 or consent of instructor. Crosslisted with: AGRO 515
- HORT 516. Molecular Analysis of Complex Traits 3 cr.
Provide a comprehensive overview of molecular genetic analysis of complex phenotypes, including case histories/experiments in plants, animals and humans. Emphasize technological developments in DNA marker technologies and their application to molecular quantitative genetics. Explore the efficient application of these technologies in the future to complex genetic systems, breeding, and other areas of life sciences. Prerequisite: AGRO 305 or consent of instructor. Same as AGRO 516.
- HORT 520. Postharvest Biology and Technology 4 cr. (3+3P)
Current advances in the physiology of maturation, ripening and senescence of horticultural commodities. Modern technologies of harvest and handling. Methods of analysis of postharvest quality components. Credit will not be given for both HORT 420 and HORT 520. Prerequisite: BIOL 314 or EPWS 314.
- HORT 530. Plant Physiology: Metabolism 3 cr.
Examination of major plant metabolic processes including photosynthesis, nitrogen metabolism, lipid and secondary plant product metabolism and investigation of how they are related. Emphasis on literature. Same as AGRO/BIOL/EPWS/MOLB 530. Prerequisites: BIOL 314 and CHEM 314, or consent of instructor.
- HORT 531. Plant Physiology: Growth and Development 3 cr.
Cellular and molecular mechanisms controlling the physiology of maturation and organ development: the roles of environmental stimuli, cell organization, differentiation and phytohormones in regulating these developmental processes. Prerequisite: either BIOL 314, BCHE 341, or BCHE 395. Same as AGRO/BIOL 531.
- HORT 533. Environmental Physiology of Plants 3 cr.
Integral responses of plants and crop productivity to naturally occurring and modified environmental factors such as radiation, temperatures, water vapor, carbon dioxide, and air flow. Prerequisite: BIOL 314 or consent of instructor. Same as AGRO/BIOL 533.
- HORT 585. Plant Cell, Tissue, and Organ Culture 3 cr. (2+3P)
Survey of cell tissue and organ culture techniques with emphasis on applications to asexual gene transfer and crop improvement, including: somaclonal variation, protoplast fusion, recombinant DNA gene transfer, microinjection, totipotency and morphogenesis. Credit will not be given for both HORT/AGRO/BIOL 340 and 585. Background in genetics and biochemistry recommended. Same as AGRO/BIOL 585.
- HORT 590. Graduate Seminar 1 cr.
Review of current scientific literature in agronomy, horticulture, and soil science. Same as AGRO/SOIL 590.
- HORT 595. Internship 1-6 cr.
Supervised professional on-the-job learning experience. Limited to Master of Agriculture candidates. Not more than 6 credits toward the degree.
- HORT 597. University Teaching Experience 1-3 cr.
Certain graduate students will be permitted to teach up to one-third of one AGRO/HORT/SOIL/E S course. The student will prepare and deliver lectures and will prepare, administer, and grade at least one examination.

The professor in charge of the course will attend and evaluate the student's lectures. Consent of instructor required. Crosslisted with: AGRO 597 and SOIL 597	
HORT 598. Special Research Programs	1-6 cr.
Individual investigations, either analytical or experimental. Maximum of 6 credits per semester. No more than 9 credits toward a degree. Prerequisite: consent of instructor.	
HORT 599. Master's Thesis	0-88 cr.
Thesis.	
HORT 609. Breeding for Plant Disease Resistance	3 cr.
A practically-oriented course of lectures and discussion on concepts and principles of breeding for disease and pest resistance. Labs familiarize students with preparation, quantification, and application of inoculum to hosts. Same as AGRO 609.	
HORT 610. Advanced Crop Breeding	4 cr. (3+3P)
Applications of breeding principles to crop improvement. Emphasis on breeding methodologies using modern techniques, including biotechnology. Prerequisite: AGRO 462 or consent of instructor. Same as AGRO 610.	
HORT 620. Instrumentation in Agronomy	3 cr.
Use of instruments used in research in all areas of agronomy including gas chromatography, high performance liquid chromatography, neutron soil moisture probe, and other instruments. Same as AGRO/SOIL 620.	
HORT 670. Biometrical Genetics of Plant Breeding	3 cr.
A statistical approach to gene action and population parameters as applied to plant improvement. Prerequisite: AGRO 462 or consent of instructor. Same as AGRO 670.	
HORT 685. Plant Genetic Engineering	3 cr.
Analysis of plant genome structure and potential applications of emerging molecular techniques to the genetic improvement of plants. Prerequisites: HORT/AGRO 585 and AGRO/HORT 506 or CHEM 545, or consent of instructor. Same as AGRO/BIOL 685.	
HORT 697. University Teaching Experience	1-3 cr.
Certain graduate students will be permitted to teach up to one-third of one AGRO/HORT/SOIL/E S course. The student will prepare and deliver lectures and will prepare, administer, and grade at least one examination. The professor in charge of the course will attend and evaluate the student's lectures. Consent of instructor required. Crosslisted with: AGRO 697 and SOIL 697	
SOIL	
SOIL 450. Special Topics	1-4 cr.
Specific subjects to be announced in the Schedule of Classes. Maximum of 4 credits per semester and a total of 9 credits towards a degree.	
SOIL 456. Irrigation and Drainage	3 cr. (2+3P)
Principles and practices required for irrigation to exist as a permanent economy. Equipment and methods for measurement and control of water.	
SOIL 472. Soil Morphology and Classification	4 cr. (2+2P)
Terminology used to describe soils. Soil classification systems of the world with emphasis on systems used in the United States. Theory of classification and taxonomy as applied to soils. Prerequisite: SOIL 252. Same as GEOG 472.	
SOIL 476. Soil Microbiology	3 cr.
Nature and physiology of soil microorganisms, how they affect plant growth and recycle nutrients. Land farming, bioremediation and other environmental problems as influenced by soil microorganisms. SOIL 252 and BIOL 311 recommended. Same as BIOL 476.	
SOIL 476 L. Soil Microbiology Laboratory	1 cr. (3P)
Enumeration of soil microorganisms, their activities, and transformations they mediate. Prerequisites: SOIL 476 or concurrent enrollment. Same as BIOL 476L.	
SOIL 477. Environmental Soil Physics	3 cr.
A description of the physical characteristics of porous media including soil. Examination of processes describing the transport of water, chemicals, heat and gases through porous media with application to environmental quality, waste management, and crop production.	
SOIL 477 L. Environmental Soil Physics Laboratory	1 cr.
Concurrent enrollment with SOIL 477 recommended. Hands on experience with techniques for characterizing soil physical properties such as particle size distribution, bulk density, water retention, hydraulic conductivity and solute transport. Demonstrations of field and laboratory techniques for measuring moisture content, soil water potential, gas/air flow and thermal conductivity. Prerequisite: SOIL 252.	
SOIL 479. Environmental Soil Chemistry	3 cr.
Basic elements of soil chemistry including discussion of clay mineralogy, cation and anion exchange and the chemistry of problem (acid, saline and flooded) soils. Credit not given for both SOIL 424 and SOIL 479. Prerequisites: SOIL 252L or GEOL 360, or three semesters of chemistry. Same as GEOL 479.	
SOIL 500. Special Topics	1-4 cr.
Specific subjects and credits to be announced in the Schedule of Classes. Maximum of 4 credits per semester. No more than 9 credits toward a degree.	
SOIL 505. Research Orientation	3 cr. (2+3P)
Training in writing research proposals, presentation of research results, and interpretation of research results. Same as AGRO/HORT 505.	
SOIL 514. Soil-Plant Relationships	3 cr.
Physical, chemical, and biological soil environment as it affects plant and crop growth. Prerequisites: BIOL 314, SOIL 252. Same as AGRO/HORT 514.	
SOIL 520. Soil Genesis	3 cr.
Five soil-forming factors will be studied: parent material, biota, climate, topography, and time. Major emphasis will be placed on parent material and topography. Same as GEOG 520.	
SOIL 590. Graduate Seminar	1 cr.
Review of current scientific literature in agronomy, horticulture, and soil science. Same as AGRO/HORT 590.	
SOIL 595. Internship	1-6 cr.
Supervised professional on-the-job learning experience. Limited to Master of Agriculture candidates. Not more than 6 credits toward the degree. Same as AGRO 595.	
SOIL 597. University Teaching Experience	1-3 cr.
Certain graduate students will be permitted to teach up to one-third of one AGRO/HORT/SOIL/ES course. The student will prepare and deliver lectures and will prepare, administer, and grade at least one examination. The professor in charge of the course will attend and evaluate the student's lectures. Consent of instructor required. Crosslisted with: AGRO 597 and HORT 597	
SOIL 598. Special Research Programs	1-6 cr.
Individual investigations, either analytical or experimental. Maximum of 6 credits per semester. No more than 9 credits toward a degree.	
SOIL 600. Doctoral Research	1-88 cr.
Research.	
SOIL 612. Advanced Soil Fertility	3 cr.
Plant nutrition, growth regulators, environmental factors affecting crop growth and mathematical expressions useful in studying crop growth and soil-nutrient-plant interactions. Prerequisite(s): SOIL 312.	
SOIL 620. Instrumentation in Agronomy	3 cr.
Use of instruments used in research in all areas of agronomy including gas chromatography, high performance liquid chromatography, neutron soil moisture probe, and other instruments. Same as AGRO/HORT.	
SOIL 630. Advanced Soil Classification	3 cr.
Philosophy and organization of various soil classification systems, some international in scope, with emphasis on the new USDA system and classroom and field experience in using this system. Prerequisite: SOIL 472 or consent of instructor.	
SOIL 640. Advanced Soil Microbiology	3 cr.
Advanced topics in soil microbiology and biochemistry, including carbon cycling, nitrogen cycling, humus formation and nature, and microbial-plant root interactions. Consent of instructor required.	
SOIL 650. Advanced Topics	1-3 cr.
Colloquium on contemporary topics associated with agriculture, environmental science and engineering. Multidisciplinary topics will be chosen to encourage participation of students from diverse disciplines. Prerequisite: consent of instructor. May be repeated for a maximum of 9 credits.	
SOIL 651. Advanced Soil Chemistry	3 cr.
Advanced treatment of soil chemistry phenomena with emphasis on arid zone soils. Particular attention is given to reactions involved in environmental pollution and management of wastes. Prerequisite: SOIL 424 or SOIL 479	
SOIL 652. Advanced Soil Physics	3 cr.
Advanced treatment of soil physics, modeling, includes working on an existing/new research project, modeling existing or new data, step by step guide on the use of some 1-D and 2-D models. Specific areas of specialization will be field scale variability of soil properties, water flow, solute transport, and plant water relations. Prerequisite(s): SOIL 477 and computer literacy; or consent of instructor.	
SOIL 655. Moisture Heat Contaminant Transport Modeling	3 cr.
Provides clear coverage of the basic principles of heat, moisture and contaminant transport through porous media, and a step-by-step guidance and hands on application on the use of some spreadsheet based and physically based one-and two-dimensional transport models. A similar course does not exist in the college for students that can encourage them to pursue modeling as a means of solving vadose zone and groundwater contamination and remediation problems. Consent of instructor required. Pre/Corequisite(s): Graduate student with at least two 400.	
SOIL 694. Doctoral Seminar	1 cr.
Current research discussions presented by doctoral level graduate students. Not more than 2 credits toward the degree. Prerequisite: doctoral level graduate students. Same as AGRO 694.	
SOIL 696. Doctoral Proposal	1 cr.
Current research proposal written by doctoral level graduate students. Not more than 1 credit toward the degree. Prerequisite: doctoral level graduate students. Same as AGRO 696.	
SOIL 697. University Teaching Experience	1-3 cr.
Certain graduate students will be permitted to teach up to one-third of one AGRO/HORT/SOIL/E S course. The student will prepare and deliver lectures and will prepare, administer, and grade at least one examination. The professor in charge of the course will attend and evaluate the student's lectures. Consent of instructor required. Crosslisted with: AGRO 697 and HORT 697	
SOIL 698. Topics in Agronomy	1-6 cr.
Topics of current interest, designated by title and credit. Maximum of 6 credits per semester. No more than 9 credits toward a degree.	

COLLEGE of ARTS and SCIENCES

Dean • *Christa D. Slaton*

Associate Dean (Research and Graduate Affairs) • *Jeffrey P. Brown*

Associate Dean (Academic Affairs) • *Beth Pollack*

Associate Dean (Academic Resources and Planning) • *Lisa Bond-Maupin*

Associate Dean (Development and External Affairs) • *Kenneth Van Winkle*

Coordinator, Student Advising • *Edward Rodriguez*

Coordinator, Student Retention • *Jodie Kenney*

Coordinator, Student Records • *Hilda M. Olivas*

Coordinator, Research Center • *Matilda Evaro*

ANTHROPOLOGY

Department website: <http://www.nmsu.edu/~anthro/>
(575) 646-2725

M. Chaiken, department head, Ph.D. (California – Santa Barbara) – Participatory development, resettlement, and rural health and nutrition, gender, applied anthropology, Africa and Southeast Asia; R. T. Alexander, Ph.D. (New Mexico) – Mesoamerican archaeology, historical archaeology of Yucatán, ethnohistory and colonialism, agrarian ecology, fauna analysis; F. Arakawa, Ph.D. (Washington State) – Southwest archaeology, ceramic analysis; B. R. Benefit, Ph.D. (NYU) – biological anthropology, African paleoanthropology, dental anthropology, paleoecology; W. Thomas Connelly, Ph.D. (California – Santa Barbara) – Agricultural systems, ecological anthropology, applied/development anthropology, Southeast Asia, East Africa, rural communities in the US; C. E. Eber, Ph.D. (SUNY-Buffalo) professor emerita – Art, drugs, gender, religion, Mesoamerica, women's studies, and writing about culture; M. McCrossin, Ph.D. (California-Berkeley) – biological anthropology, human evolution, African paleoanthropology, primatology; B. O'Leary, Ph.D. (New Mexico) – Southwest archaeology, cultural resource management, arctic ethnography; D. Pepion, Ed.D. (Montana State) – Native American studies, ethnohistory, anthropology and education; S. Rushforth, Ph.D. (Arizona) – cultural anthropology, anthropological linguistics, Native American ethnology; M.A.T. Scott, Ph.D. (Kentucky) – medical anthropology, Latin America; L. Stanford, Ph.D. (Florida) – agriculture, organizations, food studies, globalization, sociocultural anthropology, Latin America; E. Staski, Ph.D. (Arizona), Professor Emeritus – historical archaeology, urban anthropology, ethnic relations; W. Trevathan, Ph.D. (Colorado-Boulder) and Regent's Professor Emerita – reproduction, evolutionary medicine, medical anthropology, nutritional anthropology; W. Walker, Ph.D. (Arizona) – Southwest archaeology, theory and field method in archaeology, ritual prehistory.

DEGREE: Master of Arts

MAJOR: Anthropology

MINOR: Anthropology

MINOR: Archaeology

MINOR: Forensic Anthropology

The M.A. program in anthropology is designed for students who are interested in the traditional subdisciplines of anthropology and in selected areas of applied anthropology. The program is directed both toward students who intend to take a terminal M.A. degree and students who intend to enter a Ph.D. program.

A bachelor's degree in anthropology is not required for entry into the program. Nevertheless, students who lack the equivalent of ANTH 301, 315, 320, and 355 will be required to take these courses or corresponding sections of ANTH 502.

PROGRAM REQUIREMENTS

Students selecting the thesis option must complete 33 hours of basic course work, as described below, plus 6 hours of thesis credit. Students selecting the non-thesis option must complete 39 hours of course work plus an internship or special research project for an additional 6 credits. These 39 hours

consist of 33 hours of basic course work, as described below, plus an additional 6 hours of electives selected in consultation with the anthropology graduate student adviser.

The 33 hours of basic course work for students selecting either the thesis or non-thesis options are distributed as follows:

ANTH 505, Issues in Anthropological Practice

Students will be required to take a core theory course in their respective subfield and one additional core theory course in another subdiscipline: Students in the archaeology subfield must complete ANTH 585 (Method and Theory in Archaeology), earning a grade of B or better.

Students in the biological anthropology subfield must complete ANTH 513 (Biological Anthropology), earning a grade of B or better.

Students in the cultural anthropology and anthropological linguistics subfields must complete ANTH 500 (Seminar in Anthropological Theory), earning a grade of B or better.

Students will be required to take an additional topical/methodological/areal course in their respective subfield, earning a grade of B or better.

A. Students in the archaeology subfield will choose from the following options:

ANTH 507, Advanced Studies in Archaeology
ANTH 510, Southwestern Anthropology
ANTH 511, Mesoamerican Anthropology
ANTH 514, Advanced Issues in the Archaeology of Religion
ANTH 516, Advanced Archaeology of the American Southwest
ANTH 517, Advanced Topics in Mesoamerican Archaeology
ANTH 518, Advanced Historical Archaeology
ANTH 519, Advanced Topics in Prehistoric Archaeology
ANTH 526, Conquest of the New World
ANTH 540, Cultural Resource Management
ANTH 577, Faunal Analysis
ANTH 578, Advanced Lab Methods in Archaeology

B. Students in the biological anthropology subfield will choose from the following options:

ANTH 506, Advanced Studies in Physical Anthropology
ANTH 530, Forensic Anthropology and Human Osteology
ANTH 531, Issues in Nutritional Anthropology
ANTH 534, Advanced Human Evolution
ANTH 537, Applied Medical Anthropology
ANTH 572, Advanced Primate Behavior and Ecology
ANTH 573, Advanced Primate Adaptation and Evolution
ANTH 574, Advanced Human Osteology

C. Students in the cultural anthropology and anthropological linguistics subfields will choose from the following options:

ANTH 455, Federal Indian Policy
ANTH 5054, Cultures of Africa
ANTH 508, Advanced Studies in Cultural Anthropology
ANTH 509, Advanced Studies in Anthropological Linguistics
ANTH 510, Southwestern Anthropology
ANTH 511, Mesoamerican Anthropology
ANTH 515, Applied Anthropology

ANTH 520, Ethnographic Field Methods
 ANTH 525, Issues in Language and Culture
 ANTH 526, Conquest of the New World
 ANTH 532, Advanced Issues in the Anthropology of Religion
 ANTH 533, Advanced Issues in Women, Gender, and Culture
 ANTH 535, Economic Anthropology
 ANTH 536, Anthropology of Development
 ANTH 538, Plants, Culture, and Sustainable Development
 ANTH 539, Culture and Foodways

Students will earn an additional 21 credits, at least 15 of which must be in anthropology. Finally, students will earn 6 credits of thesis (ANTH 599), internship (ANTH 597), special research problems (ANTH 598), or additional courses.

ADMISSION REQUIREMENTS

To apply for admission to the M.A. program in anthropology, submit the following:

- Application form and fees (send to the Graduate School)
- Official undergraduate and graduate transcripts from all colleges and universities attended (send to the Graduate School)
- A letter from the candidate addressing his or her interests and graduate school objectives (send to the department)
- Letters of recommendation from three persons familiar with the candidate's academic record (send to the department)
- An undergraduate grade-point average of 3.0 or higher

Application materials are available on the Anthropology website <http://www.nmsu.edu/~anthro/>

Please email gradadv@nmsu.edu for further information.

GRADUATE MINOR IN NATIVE AMERICAN STUDIES— PROGRAM REQUIREMENTS

The purpose of the Native American Studies Graduate Minor are to:

- Provide an opportunity for all students to learn about Native American cultures and societies.
- Facilitate research and other creative activities that concern Native American peoples and that have potential benefit for them,
- Serve the University and State of New Mexico in ways that support and illuminate the rich heritage of Native American peoples.

NAS focuses on Native American cultures and societies, deals with contemporary and historical experiences of American Indians, and examines the contributions of Indigenous peoples to life in the United States and other American nations. This specialization field has developed in reaction to Western academic views of Native Americans and to the frequently restrictive, assimilationist approach within universities to issues concerning Native peoples. NAS contributes to a new understanding of Native American cultures and societies from contemporary and historical perspectives.

For the minor in Anthropology, students are required to complete 9 credits (3 courses) of graduate-level Anthropology coursework. A minor in anthropology provides a useful concentration for students developing professional careers in teaching, environmental sciences, international business, community development, health sciences, social work, art, historic preservation.

To qualify for a graduate minor in Native American Studies- Anthropology, students are required to complete 9 credit hours (3 classes) of graduate level courses. To record a minor on a student's transcript, the minor must be listed on the "Application for Admission to Candidacy," and the Native American Studies advisor in the Department of anthropology must sign this form. Graduate students majoring in Anthropology may not also earn a minor in the same field. Core courses for the minor are as follows:

- ANTH 541, Issues in Native American Studies
- ANTH 543, Indigenous Ways of Knowing
- ANTH 455, Federal Indian Policy

Alternative and support classes are identified below in the list of cognate classes, and one class or alternative classes may be substituted with the approval of the student's M.A. chair and the Coordinator for the Graduate Minor in Native American Studies.

Cognate Area Courses

- ENGL 557, American Indian Literatures
- GOVT 524, American Indian Politics
- HIST 509, Native American History
- MSW 564, Social Work with Native American Populations

ANTHROPOLOGY

- ANTH 449 H. Directed Reading Honors 1-3 cr.
 Same as ANTH 449. Additional work to be arranged. May be repeated for a maximum of 6 credits.
- ANTH 451. Practical Forensic Anthropology 1 cr. (3P)
 Advanced laboratory exercises in identification of human skeletal remains. May be repeated for a maximum of 3 credits. Prerequisite: ANTH 430 or ANTH 530.
- ANTH 452. Practical Fauna Analysis 1 cr.
 Advanced laboratory exercises in the identification of animal bone recovered from paleontological and archaeological contexts. Prerequisite: consent of instructor. May be repeated for a maximum of 3 credits.
- ANTH 455. Federal Indian Policy 3 cr.
 Federal Indian policy and its impact on Native Americans. This course will provide basic understanding of how federal Indian policy impacts almost all activities and situations with Native Americans. Course will also look at issues such as sovereignty and how it impacts most interactions with tribal groups.
- ANTH 458. Anthropology of Reproduction 3 cr.
 Human life cycle is studied from biological, evolutionary, cross-species, and cross-cultural perspectives. Coverage of pregnancy, birth, infancy, childhood, puberty, adulthood, menopause, aging, senescence, and death. Prerequisite: ANTH 201G or consent of instructor.
- ANTH 459. Peru: From Incas to Inca Kola 3 cr.
 Explores issues of cultural and national identity in Peru from the Incas to the present, focusing on the modern period. Themes include indigenous resistance and adaptation to colonial rule, nationalism, militarism, terrorism, globalization, and the drug trade. Crosslisted with: HIST 459
- ANTH 467. Archaeology of the American Southwest 3 cr.
 Description and analysis of prehistoric archaeology of the American Southwest including paleo-environmental reconstruction, culture change, and relations with contemporary cultures. Prerequisite: ANTH 315.
- ANTH 472. Primate Behavior and Ecology 3 cr.
 Survey of the social behavior and ecology of nonhuman primates.
- ANTH 473. Primate Adaptation and Evolution 3 cr.
 Survey of the adaptations and evolutionary history of nonhuman primates. Prerequisite: ANTH 355 or consent of instructor.
- ANTH 473 L. Primate Evolution Laboratory 1 cr. (1P)
 Laboratory with exercises on non-human primate adaptation and evolution. Consent of instructor required. Prerequisite(s): Anth 355 or consent of instructor.
- ANTH 474. Human Osteology 3 cr.
 A survey of the functional, developmental, and evolutionary biology of the human skeleton. Identifying bones and teeth from hands-on experience with skeletal and dental material. Provides a foundation for human evolutionary studies, bioarchaeology and forensic anthropology. Prerequisite: ANTH 355, 370 or equivalent.
- ANTH 474 L. Human Osteology Lab 1 cr. (1P)
 Laboratory for ANTH 474. Experiences and activities related to identifying teeth and bones of the human skeleton. Prerequisites: ANTH 355, 370 or equivalent.
- ANTH 475. Bioarchaeology and Forensic Anthropology 3 cr.
 An examination of human skeletal remains at the level of the population (bioarchaeology) and the individual (forensic anthropology). Introduction to methods used for determination of age, sex, and biological affinity and identification of pathological conditions. Principles of analysis in prehistoric demography and epidemiology will be discussed. Prerequisite: ANTH 474 or consent of instructor.
- ANTH 477. Faunal Analysis 3 cr.
 Detailed study and analysis of taphonomic processes affecting animal bone recovered from archaeological and paleontological contexts. Prerequisite: either ANTH 315, ANTH 355, or BIOL 330.
- ANTH 485. Field Experience 1-3 cr.
 Anthropological or archaeological field work experience in private, state and federal agencies. Must spend 30 hours in a field setting per credit hour earned. Prerequisite: complete 12 ANTH credits and consent of instructor. May be repeated for a maximum of 6 credits.
- ANTH 488. Advanced Field Session 1-6 cr.
 Archaeological field methods, including excavations of prehistoric sites, record keeping, mapping, and analysis of data. Prerequisites: previous field experience and consent of instructor.
- ANTH 497. Special Topics 1-6 cr.
 Specific subjects to be announced in the Schedule of Classes. May be repeated for a maximum of 12 credits. Prerequisite(s): Junior or above standing.

ANTH 500. Seminar in Anthropological Theory	3 cr.	ANTH 522. Graduate Field Session	2-6 cr.
Detailed focus on specific areas of anthropological theory. Course subtitled in the Schedule of Classes. Course may be repeated.		Techniques of archaeological data collection, analysis, and interpretation. Emphasis on archaeological field work in the Southwest.	
ANTH 501. Concepts in Anthropology	3 cr.	ANTH 523. Archaeological Mapping	3-6 cr.
Survey of concepts and theories central to the subdisciplines of anthropology.		Techniques for mapping archaeological sites and recording spatial distributions of archaeological data using a variety of surveying equipment and computer mapping software.	
ANTH 502. Fundamentals of Anthropology	1-4 cr.	ANTH 525. Issues in Language and Culture	3 cr.
Review of fundamental knowledge and theories in biological, cultural, or linguistic anthropology or archaeology. Graded S/U.		Anthropological perspective on the communication process.	
ANTH 504. Cultures of Africa	3 cr.	ANTH 526. Conquest of the New World	3 cr.
Explores the rich history and cultural diversity of the continent of Africa. The course first examines the historical processes that shaped modern Africa, including the evolution of modern humans in Africa, the origins of agriculture and pastoralism, the formation of indigenous African states, the slave trade, and European colonialism. The course also looks at contemporary African societies, including hunter-gatherer, pastoral, and farming/fishing peoples. In addition, contemporary issues facing modern Africa such as famine and agricultural policy, the status of women, and environmental challenges such as deforestation are discussed. Taught with ANTH 404. Crosslisted with: HIST 504		Study and analysis of conquest, colonialism, and culture contact as anthropological processes. The contributions and limitations of historical, ethno-historical and archaeological evidence emphasized. Prerequisite: graduate standing or consent of instructor.	
ANTH 505. Issues in Anthropological Practice	3 cr.	ANTH 530. Forensic Anthropology and Human Osteology	3 cr.
Anthropological approaches to research design, implementation, and dissemination.		Detailed study of the human skeleton with attention to health and demographic structure of prehistoric populations. Forensic applications are also considered.	
ANTH 506. Advanced Studies in Physical Anthropology	1-3 cr.	ANTH 531. Issues in Nutritional Anthropology	3 cr.
Lectures, seminars, or laboratory research in selected topics. May be repeated for a maximum of 12 credits.		Evolutionary and cross-cultural perspective on human nutrition.	
ANTH 507. Advanced Studies in Archaeology	1-3 cr.	ANTH 532. Advanced Issues in the Anthropology of Religion	3 cr.
Lectures, seminars, field or laboratory research in selected topics. May be repeated for a maximum of 12 credits.		Cross-cultural overview of spiritual beliefs and religious change. Topics include Shamanism, ethnomedicine, revitalization movements, and women's roles in spiritual life. Additional work required for graduate credit.	
ANTH 508. Advanced Studies in Cultural Anthropology	1-3 cr.	ANTH 533. Advanced Issues in Women, Gender, and Culture	3 cr.
Lectures, seminars, or field research in selected topics. May be repeated for a maximum of 12 credits.		Survey of the history of anthropological ideas about gender and women, and a comparison of gender roles, relations, and ideologies across a range of cultures. Same as W S 533.	
ANTH 509. Advanced Studies in Anthropological Linguistics	1-3 cr.	ANTH 534. Advanced Human Evolution	3 cr.
Lectures, seminars, or field research in selected topics. May be repeated for a maximum of 12 credits.		Advanced overview of human biological evolution from the emergence of Miocene apes to the modern human diaspora. Prerequisite: ANTH 355 or consent of instructor.	
ANTH 510. Southwestern Anthropology	3 cr.	ANTH 534 L. Advanced Human Evolution Lab	1 cr. (1P)
Examination of major theoretical and applied issues in southwestern anthropology.		Advanced laboratory in human evolution, includes exercises and activities to learn the human fossil record.	
ANTH 511. Mesoamerican Anthropology	3 cr.	ANTH 535. Economic Anthropology	3 cr.
Examination of major theoretical, historical, and applied issues in Mesoamerican anthropology.		Study of the theoretical development, major topics, and current theoretical concerns in economic anthropology. Anthropological analysis of economic systems, from subsistence economies to the impact of international market systems.	
ANTH 512. Analytical Methods in Anthropology	3 cr.	ANTH 536. Anthropology of Development	3 cr.
Quantitative analytical methods of anthropology examined in detail. Applied problem sets include physical and cultural anthropology, linguistics, and archaeology. Prerequisite: graduate standing or consent of instructor.		The study of global processes of social and economic change, and their impact on non-Western societies.	
ANTH 513. Biological Anthropology	3 cr.	ANTH 537. Applied Medical Anthropology	3 cr.
Examination of major theoretical and methodological issues in biological anthropology.		Covers the anthropologists' roles in medical research and health care delivery systems.	
ANTH 514. Advanced Issues in the Archaeology of Religion	3 cr.	ANTH 538. Plants, Culture, and Sustainable Development	3 cr.
Explores the methods and theories used to study prehistoric religion.		Study of role of indigenous cultures and indigenous knowledge systems in plant domestication, ethnoecology, and preservation of traditional crop diversity. Examination of issues related to conserving cultural diversity, food systems, food security and biodiversity.	
ANTH 515. Applied Anthropology	3 cr.	ANTH 539. Culture and Foodways	3 cr.
Examines the intellectual roots of applied anthropology and early case studies of anthropologists working as administrators. Examines the ethical and methodological approaches that applied anthropologists employ. Examination of case studies that show the role of applied anthropologists in improving human service delivery, cultural preservation, planning and implementing programs of participatory change, advocacy, and economic development. Taught with ANTH 415.		Study of interaction between food and culture from anthropological perspective. Study of role of food in cultural history, social relations, ritual, and identity. Examination of impact of globalization of food systems on traditional cultures, local food systems, and food security.	
ANTH 516. Advanced Archaeology of the American Southwest	3 cr.	ANTH 540. Cultural Resource Management	3 cr.
Advanced topics in Southwestern archaeology including ritual architecture, environmental reconstruction, violence, site formation processes, and experiment and research.		Study of federal and state of New Mexico historic preservation laws and regulations and their application in current Cultural Resource Management and a review of relevant case studies.	
ANTH 517. Advanced Topics in Mesoamerican Archaeology	3 cr.	ANTH 541. Issues in Native American Studies	3 cr.
Specific subjects in Mesoamerican archaeology to be announced in the Schedule of Classes. Prerequisite: graduate standing. May be repeated for a maximum of 6 credits.		This course analyzes subjects of general concern such as the development and relationship of ethnology with past and present indigenous groups in North America. Issues such as NAGPRA, protection of human subjects, cultural conflicts, emic versus etic research and study, effects of hegemony and colonization including current qualitative research practices as balanced approaches to investigation and scholarly advancement.	
ANTH 518. Advanced Historical Archaeology	3 cr.	ANTH 542. Cultural Resource Management II	3 cr.
Advanced methods and theoretical concepts regarding the archaeology of historical periods.		Continuation of ANTH 540 to include the study of cultural resource management practices, research design, and completion of proposals in response to requests. Overview of management practices and budgeting of projects and specialized studies (geophysical investigations, National Register nominations).	
ANTH 519. Advanced Topics in Prehistoric Archaeology	3 cr.	ANTH 543. Indigenous Ways of Knowing	3 cr.
Seminar on specialized research archaeology. Prerequisite: graduate standing.		This course examines Indigenous knowledge and ways of knowing as a	
ANTH 520. Ethnographic Field Methods	3 cr.		
Basic methodologies used in conducting qualitative ethnographic research. Projects in participant observation, ethnographic interviews, life history interviews, folk taxonomy construction, and coding of field notes.			

means to gain an appreciation of an epistemology and ontology that may be outside the boundaries of Eurocentric theory, concepts, and principles. Knowledge development through mythology and story telling is viewed from the nature of difference rather than comparative analysis.		
ANTH 545. Advanced Museology I	3 cr.	Museum philosophy, history, administration, and collection management. Emphasis on collecting, cataloging, care, and exhibition, as well as ethics, public responsibility, and grantsmanship.
ANTH 547. Museum Field Methods	3 cr.	Basic methodologies used in conducting museum research away from the museum, including collections evaluation, collections acquisition, donor interviews, educational outreach, and development.
ANTH 559. Peru: From Incas to Inca Kola	3 cr.	Explores issues of cultural and national identity in Peru from the Incas to the present, focusing on the modern period. Themes include indigenous resistance and adaptation to colonial rule, nationalism, militarism, terrorism, globalization, and the drug trade. Same as GOVT 565 and HIST 559.
ANTH 572. Advanced Primate Behavior and Ecology	3 cr.	Advanced review of non-human primate social behavior and ecology.
ANTH 573. Advanced Primate Adaptation and Evolution	3 cr.	Advanced review of non-human primate adaption and evolution.
ANTH 573 L. Advanced Primate Adaptation and Evolution Laboratory	1 cr. (1P)	Laboratory with exercises on non-human primate adaptation and evolution.
ANTH 574. Advanced Human Osteology	3 cr.	Advanced Human Osteology surveying the functional, developmental and evolutionary biology of the human skeleton. Identifying bones and teeth from hands-on experience with skeletal and dental material. Provides a foundation for human evolutionary studies, bioarchaeology and forensic anthropology.
ANTH 574 L. Advanced Osteology Laboratory	1 cr. (2P)	Laboratory for ANTH 574. Experiences and activities related to identifying teeth and bones of the human skeleton.
ANTH 577. Faunal Analysis	3 cr.	Detailed study and analysis of taphonomic processes affecting animal bone recovered from archaeological and paleontological contexts.
ANTH 578. Advanced Lab Methods in Archaeology	3 cr.	Examination of advanced laboratory techniques used in the analysis of archaeological materials.
ANTH 579. Anthropological Research Design	3 cr.	Implementing research projects in anthropology, including the writing of grant proposals and research papers.
ANTH 581. Graduate Study in Cultural Conservation	4 cr. (3+2P)	Same as ENGL 581, HIST 581.
ANTH 585. Method and Theory in Archaeology	3 cr.	Focus on major methodological and theoretical aspects of contemporary archeology.
ANTH 587. Field Work in Latin America	3-12 cr.	Covers anthropological field methods in Latin America that also incorporate in-field lab analysis. Prerequisite: consent of instructor. No S/U grading.
ANTH 595. Practicum in Anthropology	1-6 cr.	Internship in local, state, national, and international settings, applying anthropological concepts and theories in real-world situations. Prerequisite: consent of instructor. May be repeated for a maximum of 6 credits toward a degree. Graded S/U.
ANTH 596. Readings	1-6 cr.	Individual study of selected readings and topics. May be repeated for a maximum of 6 credits. Consent of instructor required.
ANTH 597. Internship	1-9 cr.	Anthropological or archaeological internship in private, state, or federal agency. Prerequisite: consent of instructor. May be repeated for a maximum of 18 credits.
ANTH 598. Special Research Problems	1-6 cr.	Individual analytic or experimental investigations. May be repeated under different subtitles for a maximum of 6 credits. Consent of instructor required.
ANTH 599. Master's Thesis	0-88 cr.	Thesis.

ART

Department website: www.nmsu.edu/~artdept
(575) 646-1705
artdept@nmsu.edu

Thom Brown, department head, M.F.A. (University of Pennsylvania)- painting and drawing; J. Barello, M.F.A. (University of Wisconsin-Milwaukee)—metals; T. Cole-Dorn, M.F.A. (New Mexico State University)-painting and drawing; C. Cully, M.F.A. (University of Arizona)- painting and drawing; P. Fine, M.F.A. (University of Arizona)-graphic design; J. Fitzsimmons, M.A. (New Mexico State Univeristy)— art history; M. Goehring, Ph.D. (Case Western)- art history; A. Jaffe, M.F.A. (University of Montana-Missoula)—ceramics; S. Marinas, M.A. Art Conserva- tion (Universidad Complutense de Madrid, Spain) and M.A. Anthropology (New Mexico State University)-Art Conservator; J. St. Aubyn, M. A. (University of New Mexico)—painting and drawing; R. Stevens, M.F.A. (Syracuse Universty)— sculpture; D. Taylor, M.F.A. (University of Oregon)—photography; S. Taylor, Ph.D. (Boston University)- art history; P. Thayer; Ph.D (University of Pennsylvania)- Gallery Director; E. Zarur, M.F.A., Ph.D. (University of Georgia)—art history .

DEGREE: Master of Arts
MAJOR: Art

DEGREE: Master of Fine Arts

The Master of Fine Arts is offered in studio art (ceramics, graphic design, jewelry and metalsmithing, painting and drawing, photography, and sculpture). The Master of Arts degree is offered in ceramics, graphic design, and sculpture. The Master of Arts degree with an emphasis in art history is also offered.

DEGREE: Master of Fine Arts

Emphasis: Studio - Art Requirements for an M.F.A. degree with an emphasis in studio art include a minimum of 60 credits of academic work, usually completed in three years. Of those 60 credits, 24 must be taken in the field of the declared major; 9 in minor studio areas; 9 in art history; 6 in non-art courses numbered 450 or above; 6 in thesis work; 3 in Graduate Seminar: Art Theory, Criticism, Historiography, and 3 in ART 596 or studio elective.

Program Requirements (60 cr.)	
Major studio courses	24 cr.
Minor studio courses	9 cr.
Art history courses	9 cr.
Non-art courses	6 cr.
Studio thesis	6 cr.
Graduate Seminar: Art Theory, Criticism, Historiography (ART 579)	3 cr.
Art 596 or studio elective	3 cr.

DEGREE: Master of Arts

Emphasis: Studio - Art requirements for a Master of Arts degree with an emphasis in studio art include a minimum of 33 credits. Of those 33, 12 must be taken in the field of the declared major; 6 in minor studio areas; 6 in art history; 3 in non-art courses numbered 450 or above; 3 in thesis work; and 3 in graduate seminar. (This degree is not available in drawing, painting, or photography.)

Program Requirements (33 cr.)	
Major studio courses	12 cr.
Minor studio courses	6 cr.
Art history courses	6 cr.
Non-art courses	3 cr.
Studio thesis	3 cr.
Graduate Studio Seminar (ART 596).....	3 cr.

Open Studio and Semester Reviews

In the first semester each studio graduate student will have an open studio visit with 2 or 3 faculty members. At the end of the first two semesters, each graduate student's creative production will be reviewed by the assembled faculty. Participation in semester reviews and scheduled open studio visits are required for successful portfolio completion of graduate level studio courses

including: ART 550, 555, 560, 565, 570, 575, 580, 581, 585, 590, 595, 598 or other graduate level studio courses as determined by a student's major advisor.

Thesis Committee

At the end of the third semester and after a successful candidacy the student will propose his or her thesis committee, consisting of three art department graduate faculty members, including the student's major advisor.

Candidacy

Candidacy occurs during the third semester of study in residency. Candidacy consists of a formal review of the student's work by the full faculty. If successfully completed, the faculty will advance the student to her or his final three semesters of study. If the student is not advanced by the faculty candidacy may be repeated one additional time at the end of the next consecutive semester. The final three semesters of thesis work will commence from that point. Students who are not successful in their second candidacy attempt will be disenrolled from the M.F.A./M.A. program.

Thesis Exhibition

The studio thesis will culminate in an exhibition of the candidate's creative works and a written thesis statement. A successful oral examination and defense of the thesis and exhibition is required for graduation. Two copies of the thesis and a photographic record of the final exhibition are required; other requirements may be determined by the graduate faculty. Students who do not satisfactorily complete their oral examination may not participate in the thesis exhibition.

Thesis exhibitions for the M.F.A. and M.A. degrees will be held in the spring semester in the University Art Gallery. Students who wish to graduate at mid-year are obligated to find an exhibition space other than the NMSU Art Gallery that meets with the approval of the graduate committee. In this case the student is responsible for making all arrangements for the thesis exhibition.

Admission

Admission to the M.F.A. and M.A. programs in studio art is based on an accredited B.A., B.S., or B.F.A. degree (or equivalent) with a major in art, including at least 45 credits in studio art courses and 15 credits in art history. Any deficiencies must be corrected by undergraduate course work to be completed before advancement to candidacy. Exceptions to these requirements will be considered by the area head and graduate committee. Students with an earned M.A. may be considered with the consent of the faculty, for advancement to candidacy for the M.F.A. degree upon completion of one semester or 9 credits in residence at NMSU. The number of transferable credits from a previous graduate program will be determined by the department head and the student's major professor before consideration for candidacy.

All applicants for admission to the M.F.A. and M.A. programs in studio art must submit

1. A CD/DVD with a PDF or jpeg portfolio of 20 images and an image list that identifies each piece by title, date, media and size.
2. A written statement of intent, including scholarly and professional goals and the applicant's interest in studying at NMSU
3. Letters of recommendation from three qualified people of the applicant's choice
4. Official undergraduate transcripts

Admission to the M.F.A. and M.A. programs in studio art will be decided upon consideration of all materials. The portfolio, statement, and letters of recommendation should be sent to the head of the Department of Art. Portfolio guidelines are available with Departmental application forms. Department and Graduate School applications and undergraduate transcripts are sent directly to the Graduate School. The majority of teaching assistantships and studio spaces are awarded in the fall. Psychometric test scores are not required.

DEGREE: Master of Arts

Emphasis: Art History

An emphasis in art history requires a minimum of 33 credits of art history courses, 6 of which may be thesis credits. Of the required minimum, 6 credits of related courses may be substituted with the approval of the department head and the student's major advisor.

Reading proficiency in a foreign language is also required and should be acquired prior to the beginning of thesis research for which it will be employed. A reading proficiency exam will be arranged in conjunction with the major advisor. Admission to the M.A. program with an emphasis in art history is based on an

accredited B.A. or B.S. degree (or equivalent) with a major in art history, including at least 33 art history credits and 9 studio credits. Undergraduate deficiencies must be completed before advancement to candidacy.

Candidacy and Thesis Committee Selection

Upon satisfactory completion of all required course work (except thesis credits) and foreign language requirement, the student will prepare a thesis proposal under the direction of the major professor. The student will then select the second member of his or her thesis committee and submit the proposal to this committee member for approval. With the backing of these two advisors, the student must then present the proposal to the department faculty. After a successful presentation, the student will advance to candidacy and select the third committee member, who may be from outside the art department.

Admission

All applicants for admission to the M.A. program must submit

1. A polished undergraduate research paper,
2. A written statement of intent,
3. Letters of recommendation from three qualified people of the applicant's choice, and
4. Official undergraduate transcripts.

Research papers, statement of intent, and letters of recommendation should be sent to the Department of Art. Applications and official undergraduate transcripts should be sent directly to the Graduate School. Psychometric test scores are not required.

Application Deadline

The final submission date for all application materials and teaching assistantship applications is January 20 for the fall semester.

ART

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|---|--------------|
| ART 450. Drawing Workshop | 3 cr. |
| Critique class on drawings done outside of class. Emphasis on development of conceptual and technical skills. Prerequisite: ART 350. | |
| ART 451. Time-Based Media | 3 cr. |
| Advance figure drawing class with emphasis on developing technical and conceptual skills. Prerequisite: ART 350. May be repeated up to 27 credits. Restricted to ART majors. | |
| ART 454. Design Discourse | 3 cr. |
| Discussion of issues related to visual communications and graphic design. Research and semester-long studio project supplement readings and discussion. May be repeated for a maximum of 6 credits. Prerequisite(s): ART 356. | |
| ART 455. Advanced Graphic Design: Conceptual Development and Professional Practice | 3 cr. (2+4P) |
| Advanced graphic design projects in graphic form, typographic design, and comprehensive layouts, with emphasis on conceptual development and professional practices. May be repeated to a maximum of 6 credits. Prerequisite(s): ART 356. | |
| ART 456. Advanced Graphic Design: Portfolio Development and Professional Practice | 3 cr. (2+4P) |
| Advanced graphic design projects with an emphasis on conceptual development, portfolio preparation, and professional practices. Prerequisite: ART 455. May be repeated for a maximum of 12 credits. Restricted to majors. | |
| ART 457. Advanced Typographic Design and the Computer | 3 cr. |
| Advanced projects exploring use of typography in visual communication. Electronic and conventional print applications emphasized. May be repeated for a maximum of 6 credits. Prerequisite(s): ART 255 and ART 256. | |
| ART 458. The New Mexico Studio of Design | 3 cr. |
| An advanced graphic design studio providing a design service for nonprofit community organizations. Client-based projects produced by students from concept to completion. May be repeated for a maximum of 6 credits. Prerequisite(s): ART 355. | |
| ART 459. Advanced Digital Illustration | 3 cr. (2+4P) |
| Illustration course for graphic designers emphasizing the creation of editorial, informational, and cultural illustrations, using vector and bitmap computer programs. Prerequisite: ART 359, or consent of instructor. May be repeated for a maximum of 6 credits. | |
| ART 460. Painting Workshop | 3 cr. |
| Media, materials and advanced technical problems of contemporary painters. May be taken up to 6 credits. Prerequisite(s): ART 350 and ART 361. | |
| ART 461. Painting Workshop II | 3 cr. (2+4P) |
| Advanced issues in contemporary painting. May be repeated for a maximum of 6 credits. Restricted to majors. Prerequisite(s): ART 460. | |

- ART 465. Sculpture Workshop 3-6 cr. (2+4P)
Development of content and personal vision via self-styled projects. Emphasis on critical self-evaluation. Contemporary topics and research presentation furthering the development of a cohesive body of work. Prerequisite: ART 366. May be repeated for a maximum of 12 credits.
- ART 470. Studio Photography 3 cr.
A critique and reading course in which students pursue independent work. Emphasis placed on portfolio production and professional practice. Consent of instructor required.
- ART 471. Large Format Photography and Lighting 3 cr. (2+4P)
Introduction to the 4x5 view camera, medium format cameras, Zone system and artificial lighting. Emphasis on refinement of technical process and critical thinking. Prerequisite: ART 271. May be repeated up to 6 credits. Restricted to ART majors.
- ART 473. Photography Workshop 3-6 cr.
Project based critique seminar for advanced BFA students. Regular critique sessions and readings required. Participation in the annual BFA exhibition for graduating seniors required.
- ART 474. Advanced Ceramic Tile 3 cr. (2+4P)
Instruction in a variety of ceramic tile-making techniques with considerable exploration of surface finishing. Assignments focus on tile paintings and murals with an emphasis on content. Prerequisite: ART 374. May be repeated for a maximum of 9 credits.
- ART 475. Ceramics Workshop 3-6 cr. (2+4P)
Continuation of ART 375. Prerequisite: ART 375. May be repeated for 18 credits.
- ART 476. Advanced Museum/Gallery Research Internship 1-9 cr.
Advanced research internship in museum or gallery. Requirements determined by instructor in cooperation with supervising museum/gallery professional. For art history credit. Prerequisite: ART 376 and consent of instructor. May be repeated for a maximum of 9 credits. Course may not be audited.
- ART 477. Independent Research Problems in Art History 1-9 cr.
Advanced research on special problems to be conducted under supervision of art history faculty. May be taken up to 12 credits. Consent of instructor required. Prerequisite(s): ART 295G, ART 296G, ART 297 and one 300 level art history course and consent of instructor.
- ART 478. Seminar: Selected Topics in Art History 3 cr.
Reading, research, and discussion of advanced problems. May be taken up to 12 credits. Consent of instructor required. Prerequisite(s): ART 295G, ART 296G, ART 297 and one 300 level art history course and consent of instructor.
- ART 479. Art Theory, Criticism, and Historiography 3 cr.
Theories and methodologies in art history and art criticism. Consent of instructor required. Prerequisite(s): ART 295G, ART 296G, ART 297 and one 300 level art history course and consent of instructor.
- ART 480. Printmaking Workshop 3-6 cr.
Problems in printmaking. May be repeated for a maximum of 15 credits. Prerequisite(s): ART 380.
- ART 485. Metals Workshop 3-6 cr.
Advanced individual problems. Prerequisite: 6 credits of ART 385. May be repeated for a maximum of 15 credits.
- ART 494. Special Topics in Studio 3 cr.
Specific subjects and credits to be announced in the Schedule of Classes. No more than 9 credits toward a degree.
- ART 495. Undergraduate Studio Thesis 3 cr.
Special research and independent study leading to undergraduate thesis exhibition. Prerequisite: consent of instructor. Restricted to majors. Course may not be audited.
- ART 496. Fundamentals of Studio Management 1 cr.
Advanced studio course designed to introduce students to the fundamentals of studio management. Includes training in proper tools use and maintenance; safety procedures; and practical experience with studio oversight. Concurrent registration in advanced level studio course of the same media area required. Prerequisite: consent of instructor. May be repeated for a maximum of 3 credits. Restricted to majors. Graded S/U.
- ART 497. Readings in Art History 3 cr.
In-depth study of art historical writing. May be taken up to 12 credits. Consent of instructor required. Prerequisite(s): ART 295G, ART 296G, ART 297 and one 300 level art history course.
- ART 499. Problems in Studio 3-6 cr.
Individual study in specialized studio areas not covered by other advanced courses. Prerequisite: consent of instructor. May be repeated for a maximum of 12 credits.
- ART 500. Special Topics in Art History Advanced 3 cr.
Specific subjects to be announced in the Schedule of Classes. Prerequisite: graduate status. May be repeated for a maximum of 12 credits.
- ART 501. Museum Conservation Techniques I 3 cr. (3P)
Examines the philosophy of museum conservation of works of art in all media and in all contexts. Includes discussions of the theory of conservation as well as student laboratory projects involving testing and conservation objects. Enrollment limited to 5. First of three consecutive courses. Restricted to majors. Same as ART 401 with additional or differentiated assignments for graduate students. Instructor permission required.
- ART 502. Museum Conservation Techniques II 3 cr. (2+3P)
Museum Conservation of art work at the graduate level. Examines the philosophy of museum conservation of works of art in all media and in all contexts. Includes discussions of the theory of conservation as well as student laboratory projects involving testing and conservation of objects. Enrollment limited to five. Second of three consecutive courses. (This new elective course meets additional interest area.) Prerequisite: ART 501 and consent of instructor.
- ART 503. Preventive Conservation/Collections Care 3 cr.
Museum conservation of art work at the graduate level. Taught with Art 403 with differentiated assignments for graduate students.
- ART 504. The Classical Style in the Western Tradition 3 cr.
Analysis of the emergence of Greco-Roman style in the Ancient world and its interpretation and reception in the Western European art tradition up to the contemporary period; taught with ART 302. Consent of instructor required.
- ART 505. Medieval Art 3 cr.
History of painting, stained glass, sculpture, architecture and manuscript illumination in Europe from the Early Christian period to the end of the Gothic period; taught with ART 305. Consent of instructor required. Prerequisite(s): ART 295G; Graduate Standing.
- ART 506. Medieval Manuscript Illumination 3 cr.
History of manuscript production and illumination in Western Europe from the Early Christian period to the middle of the 16th century; taught with ART 306. Consent of instructor required. Prerequisite(s): ART 295 and ART 305 or ART 505.
- ART 510. Advanced Native American Art 3 cr.
Cross-cultural introduction to art of the prehistoric and historic native people of the North, Central, and South Americas. The artistic expression and the function of art considered in diverse cultural and environmental contexts. Prerequisite: graduate standing.
- ART 511. Art of China 3 cr.
Survey of the art of China from the Pre-historic period to modern day; taught with ART 311. Prerequisite(s): Graduate Standing.
- ART 520. Art and Architecture in Pre-Columbian Mesoamerica 3 cr.
Analysis of the art and culture of the Mesoamerican peoples before the arrival of Columbus in the New World. Includes an in-depth formal and historical analysis of architecture, sculpture, painting, pottery and metal works of Mixtec, Toltec, the Aztec, Maya, and other cultures and civilizations. Prerequisite: graduate standing.
- ART 521. Pre-Columbian Art and Architecture of the Andes 3 cr.
Examines the arts and history of pre-Columbian Andean cultures in a cultural context. Analysis of their architecture, sculpture, pottery, jewelry, textiles, and featherwork. Prerequisite: graduate standing.
- ART 523. Italian Renaissance Art 3 cr.
History of painting, sculpture and architecture in Italy from the 14th century to the end of the 16th century; taught with ART 323. Consent of instructor required. Prerequisite(s): Graduate standing.
- ART 525. Northern Renaissance Art 3 cr.
History of painting, manuscript illumination and graphics in Northern Europe from the late 14th century to the mid-16th century; taught with ART 325. Consent of instructor required. Prerequisite(s): ART 295G, ART 296G and Graduate standing.
- ART 528. Art and Architecture in Northern Europe 3 cr.
Architecture, painting, and sculpture in Flanders, Holland, France, England, and Germany as indigenous developments and as reflections of the Italian Baroque. Prerequisite: graduate standing.
- ART 529. Survey of Western Architecture 3 cr.
Survey of history of Western architecture from prehistoric time to the present. Prerequisite(s): Graduate standing.
- ART 530. Modern Architecture 3 cr.
Study of the architecture of the later eighteenth, nineteenth and twentieth centuries in the context of technological, social and stylistic changes. Focus on the works of Louis Sullivan, Frank Lloyd Wright, and European architects of the International Style, and the current reaction. Prerequisite: graduate standing.

- ART 533. Baroque Art and Architecture in Italy, Spain, and Hispanic Latin America 3 cr.
Concentration on Italian and Spanish Baroque architecture, painting, and sculpture, as well as the art and architecture of Spanish vice-royalties of the Americas. Prerequisite: graduate standing.
- ART 536. The African American in Art 3 cr.
Traces the inclusion of African American subjects and producers of art in the U.S. from the nation's beginnings to the present. Slavery, civil rights, and racial pride are discussed as academic and avant-garde traditions in African American art. Fulfill r Prerequisite(s): ART 297 or consent of instructor. Graduate standing.
- ART 537. American Art to 1900 3 cr.
Covers the history of painting, sculpture, architecture, and other arts in the United States from the colonial period to 1900. Prerequisite: graduate standing.
- ART 538. Late Eighteenth- and Nineteenth-Century European Art 3 cr.
History of painting, sculpture, architecture, and other arts created in Europe from 1789 to 1900. Prerequisite: graduate standing.
- ART 539. Advanced History of Photography 3 cr.
Course studies history, theory and use of photographic practices in art, especially from formal introduction of the process in 1839 to the present. Prerequisite(s): ART 295G, ART 296G, and ART 297; Graduate standing.
- ART 542. Twentieth-Century Art I, 1900-1945 3 cr.
History of painting, sculpture, and other arts in Europe, the United States, and elsewhere from 1900 to 1945. Prerequisite: graduate standing.
- ART 543. Twentieth-Century Art II, 1945-Present 3 cr.
History of painting, sculpture, and other arts in Europe, the United States, and elsewhere from 1945 to the present. Comprehensive research paper required. Prerequisite: graduate standing.
- ART 544. Art and Life in Renaissance Italy 3 cr.
Examines how Italian Renaissance textual and visual culture offered Europe new ways of seeing and portraying itself, 1350-1550. Topics include: Florence, Venice, Rome, Leonardo, Michelangelo, Titian, humanism, the Medici, and republican and courtly culture. Prerequisites: ART 295, 296, 297. Same as HIST 542.
- ART 549. Advance Figure Drawing 3 cr. (2+4P)
Advanced figure drawing class with emphasis on developing technical and conceptual skills. Prerequisite: ART 449
- ART 550. Drawing Workshop 3 cr.
A critique class based on drawing done outside of class. Emphasis on development of technical and conceptual skills. Restricted to graduate art students. May be repeated up to 27 credits.
- ART 555. Graphic Design 3 cr.
May be repeated up to 27 credits.
- ART 560. Painting Workshop 3-9 cr.
Advanced work with painting skills. Emphasis on critical analysis and development of body of work. Restricted to graduate art students. May be repeated up to 27 credits.
- ART 565. Sculpture Media 3-9 cr.
May be repeated up to 27 credits.
- ART 566. Digital Photography, Image Capture and Output 3 cr. (2+4P)
Introduction to digital workflow in photography. Topics include digital camera operation, RAW file processing, scanning, color management and printing. Course will emphasize concepts of ideation and thematic coherence. May be repeated up to 6 credits.
- ART 567. Pinhole Photography 3 cr.
Construction and use of pinhole cameras. Includes experimental cameras, color and black and white materials. Reading and critique. Prerequisites: ART 270, ART 271, and ART 370. Restricted to majors.
- ART 568. Advanced Large Format Photography and Advanced Printing 3 cr.
Introduction to the 4x5 view camera, advanced printing techniques, zone system and hybrid darkroom/digital practice. Emphasis on development of advanced skills in technical process, ideation, content generation and critical inquiry. Consent of instructor required. Prerequisite(s): ART 270, ART 271, ART 274.
- ART 569. The Constructed Image 3 cr.
Covers advanced work with manipulation of conventional photographic materials and issues of post visualization. Emphasis on creation of an extended body of work. Prerequisite: consent of instructor. Restricted to majors.
- ART 570. Advanced Introduction to Photography 3-9 cr.
Introduction to photography with digital cameras. Basic camera operation, picture composition, image processing and digital workflow. Image culture and the role of the still, lens-made image in contemporary society. Students must come equipped with an appropriate laptop computer, software and digital camera (consult with instructor). Consent of instructor required. Prerequisite(s): ART 270.
- ART 571. Advanced Introduction to Film and Darkroom 3 cr.
Introduction to silver based photographic materials, film development, enlargement printing and darkroom work. Students will work with a range of cameras including: medium format, toy and pinhole. Emphasis on understanding the syntax of silver halide photographic materials. Development of conceptual vocabulary and the creation of images with thematic unity. May be repeated for a maximum of 6 credits. Consent of instructor required. Prerequisite(s): ART 271.
- ART 573. Non-Silver Photographic Processes 3 cr.
Advanced work with historic photographic processes. Emphasis on creation of an extended body of work. Taught with ART 373. Consent of instructor required. Prerequisite(s): ART 270, ART 271, ART 274. Restricted to ART majors.
- ART 575. Ceramic Arts 3-9 cr.
May be repeated up to 27 credits.
- ART 576. Museum/Gallery Research Internship 1-9 cr.
Research internship in museum or gallery. Requirements determined by instructor in cooperation with supervising museum/gallery professional. For art history credit. Prerequisite: graduate standing. May be repeated for a maximum of 9 credits.
- ART 577. Independent Research Problems in Art History 1-9 cr.
Advanced research on special problems to be conducted under supervision of art history faculty. May be repeated for a maximum of 9 credits. Consent of instructor required. Prerequisite(s): Graduate standing.
- ART 578. Seminar: Selected Topics in Art History 3 cr.
Reading, research, and discussion of advanced problems. Prerequisite: graduate standing. May be repeated for a maximum of 9 credits.
- ART 579. Graduate Seminar: Art Theory, Criticism, Historiography 3 cr.
Theories and methodologies in art history and art criticism. Prerequisite: graduate standing.
- ART 580. Printmaking Workshop 3-6 cr.
May be repeated for a maximum of 33 credits. Prerequisite(s): Graduate standing.
- ART 581. Printmaking, Professional study 1-3 cr.
Professional development in the discipline of printmaking. May be repeated for a maximum of 6 credits.
- ART 582. Advanced Digital Capture and Output 3-9 cr.
Advanced digital workflow, scanning, image processing software, digital printing, color management. Advanced digital printing skills. Emphasis on understanding the syntax of digital photographic processes. Development of conceptual vocabulary and the creation of images with thematic unity. Consent of instructor required. Restricted to ART majors.
- ART 583. Advanced Studio to Photograph 3 cr.
Studio photography and lighting technique. Advanced exploration of formal methods, visual narrative, staged imagery and location work. Emphasis on independent projects and development of thematic unity. Reading and critique.
- ART 585. Metals and Jewelry Design 3-9 cr.
May be repeated up to 27 credits.
- ART 587. Exhibition Studies 3 cr.
Exhibition theory through practice. Gallery operations and management: collecting, conservation, exhibiting, and public responsibility.
- ART 589. Visual Culture of the 1950s 3 cr.
Focuses on major cultural trends and historical events in 1950s America. Offers analysis of art, films, and pop culture phenomena of the period. Fulfill all requirements of ART 389 plus graduate-level research. Prerequisite(s): Either ART 297, ART 342, or consent of instructor. Graduate standing.
- ART 590. Visual Culture of the 1960s 3 cr.
Focuses on major cultural trends and historical events in 1960s America. Offers analysis of art, films, and pop culture phenomena of the period. Fulfill all requirements of ART 390 plus graduate-level research. Prerequisite(s): Either ART 297, ART 343, or consent of instructor. Graduate standing.
- ART 591. Visual Culture of the 1970s 3 cr.
Focuses on major cultural trends and historical events in 1970s America. Offers analysis of art, films, and pop culture phenomena of the period. Fulfill all requirements of ART 391 plus graduate-level research. Prerequisite(s): Either ART 297, ART 343, or consent of instructor. Graduate standing.
- ART 592. Visual Culture of the 1980s 3 cr.
Focuses on major cultural trends and historical events in 1980s America. Offers analysis of art, films, and pop culture phenomena of the period. Fulfill all requirements of ART 392 plus graduate-level research. Prerequisite(s): Either ART 297, ART 343, or consent of instructor. Graduate standing.

- ART 593. History of Collage 3 cr.
Examines theory and practice of collage, assembly, and montage in 2 and 3-dimensional, 20th century art. Emphasis on the art of the Schwitters, Picasso, Cornell, Hoch, Ernst, Ryan, Rauschenberg, and Schapiro. Fulfill all requirements of ART 393 plus graduate-level research. Prerequisite(s): Either ART 297, ART 342, ART 343, or consent of instructor.
- ART 595. Problems in Studio 3-6 cr.
Individualized study in specialized studio areas not covered by other advanced courses. May be repeated for a maximum of 12 credits. Consent of instructor required.
- ART 596. Graduate Studio Seminar 3 cr.
Explores issues in contemporary art making and their relationship to personal work. Presentation of research in oral, visual, and written form. Prerequisite: graduate standing. May be repeated for a maximum of 6 credits. Restricted to majors.
- ART 597. Readings in Art History 3 cr.
In-depth study of historical writing about art. Prerequisite: graduate standing. May be repeated for a maximum of 9 credits.
- ART 598. Studio Thesis 1-88 cr.
Special research in studio, leading to an exhibition and written thesis statement.
- ART 599. Art History Thesis 0-88 cr.
Art history master's thesis research. May be repeated for unlimited credit. Restricted to masters level art history students. Consent of instructor required. Prerequisite(s): Graduate standing.

ASTRONOMY

Department website: <http://astronomy.nmsu.edu/>
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murphy@nmsu.edu

J. Murphy, department head, Ph.D. (U Washington)-planetary atmospheres and exploration; R. F. Beebe, Ph.D. (Indiana-Bloomington)-planetary astronomy and stellar spectra; N. Chanover, Ph.D. (New Mexico State)-planetary astronomy; C. Churchill, Ph.D. (California-Santa Cruz)-specialty galaxies and intergalactic medium; T. Harrison, Ph.D. (Minnesota)-cataclysmic variables and gamma-ray burst sources; J. Holtzman, Ph.D. (California-Santa Cruz)-stellar populations in galaxies and theoretical cosmology; J. Jackiewicz, Ph.D. (Boston College)-Helioseismology, theoretical condensed matter physics; A. Klypin, Ph.D. (Moscow)-cosmology; R.T.J. McAteer, Ph.D. (Queen's Univeristy, Belfast)-solar physics, Sun-Earth connection; B. J. McNamara, Ph.D. (California-Santa Cruz)-stellar photometry, star clusters, and gamma-ray astronomy; N. Vogt, Ph.D. (Cornell)-galaxy evolution; R. Waltherbos, Ph.D. (Leiden)-interstellar medium, star formation, and structure and evolution of galaxies; W. Webber, Ph.D. (Iowa)-high energy astrophysics

DEGREE: Master of Science
MAJOR: Astronomy

DEGREE: Doctor of Philosophy
MAJOR: Astronomy

MINOR: Astronomy

The Department of Astronomy offers graduate work leading to the Doctor of Philosophy and Master of Science degrees. An undergraduate astronomy minor degree is offered as well. To be admitted as a regular student to the NMSU Graduate School as a major in astronomy, a student must present a suitable undergraduate background with emphasis (12-16 credits) on junior-senior level physics, and mathematics through differential equations. The prospective student is also required to take aptitude and physics (or approved specialized field) sections of the Graduate Record Examination (GRE).

Information on assistantships and fellowships in teaching and research can be obtained from the department.

Each entering graduate student will be assigned a committee that will guide the student in choice of courses, suggest training needed to remedy deficiencies (possibly to be taken without credit), and determine specific degree requirements in accord with the student's needs and objectives, and in agreement with departmental policies.

In addition to courses and research in astronomy (including 27 traditional course credit hours and 4 seminar-class credit hours), the Ph.D. student is required to take at least 6 credits of graduate-level coursework outside of the Department of Astronomy, beyond any deficiencies. These outside courses are most appropriately taken in the student's research focus area and are historically taken in the Physics, Electrical Engineering, Geology, and Mathematical Sciences departments. Each student must demonstrate no later than during the second year sufficient academic and research ability to qualify for continuation in doctoral studies.

It is possible, through arrangement with the Department of Physics, to obtain a Master of Science degree in physics during progress toward the Ph.D. in astronomy. See the "Department of Physics" section in this catalog for details of that program.

The M.S. degree in astronomy is closely connected with the astronomy Ph.D. program, and questions concerning requirements should be directed to the department.

Qualifying, Comprehensive and Final examinations are described elsewhere in this catalog. Questions concerning styles of the examinations should be directed to the department head.

The department operates three observatories. The first is the Apache Point 3.5-m telescope, which is run by the Astrophysical Research Consortium. The second is a 1-m telescope also at Apache Point, which is solely operated by NMSU and has a wide-field CCD-imaging system. The third observatory at Tortugas Mountain has a 24-inch telescope with a CCD imager for planetary research. The department is also a participant in the Sloan Digital Sky Survey project at Apache Point Observatory. The department is home to NASA's Planetary Data System's Planetary Atmosphere Node, at which solar system exploration data are archived.

ASTRONOMY

- ASTR 461. Astronomy for Teachers 3 cr.
Illustration and presentation of concepts of astronomy in different subject areas to broaden teacher preparation for science education in public schools.
- ASTR 500. Seminar 1 cr.
Organized group study treating selected topics.
- ASTR 505. Astronomy and Astrophysics I (f) 3 cr.
Application of physical principles to problems in modern astronomy. Emphasis will be on radiation mechanisms and radiation transfer in astronomical systems. Prerequisite: consent of instructor.
- ASTR 506. Astronomy and Astrophysics II (s) 3 cr.
A sequel to ASTR 505 with emphasis on basic dynamics and (magneto) hydrodynamics. Prerequisite: consent of instructor.
- ASTR 508. Astronomy for Educators 3 cr.
Assists K-12 teacher in developing pedagogy and content knowledge in the subject of astronomy. Addresses New Mexico benchmarks and standards.
- ASTR 509. Astronomy Laboratory Workshop for Educators 3 cr. (6P)
Intensive laboratory experience in Astronomy intended for educators. Part of the Masters of Art in Teaching (MAT) curriculum. Pre/Corequisite(s): ASTR 508 or consent of instructor. Restricted to MAT Program majors.
- ASTR 515. Stellar Atmospheres 3 cr.
Atmospheres of the sun and stars with emphasis on current theoretical models. Prerequisite: consent of instructor.
- ASTR 535. Observational Techniques I (f) 3 cr.
Up-to-date introduction to modern observational astronomy in a two-semester sequence. Topics include: introduction to computers, error analysis in data, the different types of optical telescopes, and optical and infrared photometry, image processing, and detectors.
- ASTR 536. Observational Techniques in Astronomy II (s) 3 cr.
Sequel to ASTR 535. The second half of the course emphasizes observational techniques in spectroscopy, radio astronomy, and high energy astrophysics. Prerequisite: ASTR 535.
- ASTR 545. Stellar Spectroscopy 3 cr.
Observational spectroscopy including instrumentation, observational techniques, classification, radial velocity methods, properties of stellar atmospheres, and interpretation of aggregate spectra such as galaxies and QSO's.
- ASTR 565. Stellar Interiors 3 cr.
Internal constitutions of stars, computation of stellar models, and stellar evolution. Prerequisite: consent of instructor.
- ASTR 575. Computational Astrophysics 3 cr.
Scientific programming in the C language for astronomical applications.

Explore key algorithms and standard techniques for imaging and spectroscopic data analysis. Topics include pointers, data structures, dynamic memory allocation, and least squares fitting, grid and iterative search methods, LCG random number generators, Monte Carlo simulations, numerical integration, and astronomical image and spectrum manipulation. Applications to real astronomical datasets are emphasized.

ASTR 598. Special Research Programs Individual investigations, either analytical or experimental.	1-6 cr.
ASTR 599. Master's Thesis Master's level research in astrophysics or observational astronomy.	0-88 cr.
ASTR 600. Pre-dissertation Research Research.	1-88 cr.
ASTR 605. Interstellar Medium Problems associated with gas and dust in the galaxy and with diffuse and planetary nebulae.	3 cr.
ASTR 610. Radio Astronomy Techniques and observations stressing the operational approach to measurement and how the observations are intimately interwoven throughout modern astrophysics. Prerequisite: consent of instructor.	3 cr.
ASTR 615. Galactic Structure The structure, composition and evolution of galaxies with special emphasis on our galaxy. Topics include solar motion, galactic kinematics, the structure of the disk and spheroid, star clusters, chemical evolution, and the classification of galaxies.	3 cr.
ASTR 616. Galaxies Structure and evolution of galaxies; galaxy types, dark matter, x-ray gas in ellipticals, interacting and starburst galaxies, active galactic nuclei and quasars, and the physics of radio jets. Prerequisite: consent of instructor.	3 cr.
ASTR 620. Planetary Science I Evaluation and analysis of observational data on solar system objects to determine their nature and physical conditions, with emphasis upon atmospheres (composition, structure, thermodynamics, evolution, etc.)	3 cr.
ASTR 621. Planetary Science II The physical processes involved in planetary system formation are addressed. Specific foci include molecular cloud collapse, disk processes, and competing theories of planet formation within disks. Additional topics to be discussed may include: the solar wind, planetary magnetic fields, planetary ring processes, and mineralogy.	3 cr.
ASTR 625. Cosmology Discussion of our current knowledge of the structure of the universe and current research methods. Topics include the distance scale, clustering of galaxies, large-scale structure, metrics, dark matter, and cosmological probes such as distant quasars, radio galaxies, and gravitational lenses. Prerequisite: consent of instructor.	3 cr.
ASTR 675. Star Formation and Evolution The beginning and ending phases of stellar evolution. Topics include star formation and bipolar outflows, the basics of stellar interiors, evolution of close double stars, stellar mass loss, and the end phases of stellar evolution; planetary nebulae, neutron stars and black holes.	3 cr.
ASTR 698. Special Topics. Special topics.	1-9 cr.
ASTR 700. Doctoral Dissertation Dissertation.	0-88 cr.

BIOLOGY

Department website: <http://biology-web.nmsu.edu/>
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M.K. Nishiguchi, department head, Ph.D. (California-Santa Cruz)-evolutionary microbiology, marine symbiosis; J.E. Gustafson, associate department head, Ph.D. (University of Zurich)- microbiology; C. D. Bailey, Ph.D. (Cornell)- plant systematics; M.H. Bernstein, Ph.D. (California-Los Angeles) - animal physiology; W. J. Boecklen, Ph.D. (Northern Arizona)-plant/insect and community ecology; M. G. Castillo, Ph.D. (Wisconsin)- microbiology/immunology; J. Curtiss, Ph.D. (Colorado)-cell and development; A. L. Dawe, Ph.D., (Tennessee)-eukaryotic microbiology; V. P. Gutschick, Ph.D. (Emeritus, California Institute of Technology)-quantitative plant physiology/physiological ecology; K. A. Hanley, Ph.D. (California-San Diego)- evolution, ecology, and control of flaviviruses; I. A. Hansen, Ph.D. (University of Wurzburg)- molecular vector biology; P. W. Houde, Ph.D. (Howard)-avian systematics; K. E. Mabry, Ph.D. (California- Davis)-

behavioral ecology; B. G. Milligan, Ph.D. (California-Davis)-plant evolutionary biology; M. R. Preszler, Ph.D. (Northern Arizona)-biology education; E. E. Serrano, Ph.D. (Stanford)-biophysics, neuroscience; C. B. Shuster, Ph.D. (Tufts)-cell and developmental biology; M. Shuster, Ph.D. (Tufts)-biology education; G. B. Smith, Ph.D. (North Carolina State)-environmental microbiology; Richard Spellenberg, Ph.D. (Emeritus; Washington)- plant systematics; H. Throop, Ph.D. (Stony Brook)-Ecosystem Ecology; G. A. Unguez, Ph.D. (California-Los Angeles)-developmental biology; T. F. Wright, Ph.D. (California-San Diego)-animal behavior and evolution; J. Xu, Ph.D. (Military Medical University, Shanghai)- mosquito- malaria interactions. Affiliated faculty: M.M. Ballyk, Ph.D. (McMaster)- mathematical models of complex biological systems; B.T. Bestelmeyer, Ph.D. (Colorado State)-ecosystems; R. L. Byford, Ph.D. (Oklahoma State)- veterinary entomology; J.W. Cain, Ph.D. (Arizona)- Wildlife and Conservation Biology; P. Cooke, Ph.D. (New Hampshire)- integrated imaging of complex biological materials; M. Courtney, Ph.D. (Arizona)- population ecology and evolutionary biology; J. J. Ellington, Ph.D. (Cornell)- entomology; J. Kemp, Ph.D. (California- Los Angeles)- plant molecular biology; H. G. Kinzer, Ph.D. (Oklahoma State)- medical and veterinary entomology; D. P. C. Peters, Ph.D. (Colorado State)- plant ecology; D. Richman, Ph.D. (Florida)- arachnology and entomology; J. Train, M.D. (Texas)- Geriatric medicine; W.A. Van Voorhies, Ph.D. (arizona)- metabolic functions in aging; W. Whitford, Ph.D. (Rhode Island)- ecology of arid lands; W.D. Wilson, Ph.D. (New Mexico)- fisheries population biology; G. Yair, Ph.D. (Ben Gurion/Los Alamos)- Nuclear physics and engineering; M. Zeng, Ph.D. (Tel Aviv)- microbial infectious diseases and vaccine development.

DEGREE: Master of Science MAJOR: Biology

DEGREE: Doctor of Philosophy MAJOR: Biology

The Department of Biology offers graduate study leading to the Doctor of Philosophy and Master of Science degrees. The Master of Science degree can be obtained through either a thesis option or a nonthesis option. Both options require 30 credits of course work. The non-thesis option can be completed as an accelerated (one-year) program concentrating on biotechnology.

To be admitted as a regular student to the Graduate School for a thesis-based Master of Science or Doctor of Philosophy degree in biology, an applicant must submit to the Department of Biology the following items (available as a PDF packet on the Biology Department's website):

- 1.a one- page written statement of educational objectives and research interests;
- 2.the Graduate Advisor form;
- 3.the Application for Financial Support if they wish to be considered for a graduate assistantship;
- 4.an unofficial transcript from all college and universities attended;
- 5.three letters of recommendation.

To be admitted as a regular student to the Graduate School for a non- thesis Master of Science in biology, an applicant must submit to the Department of Biology a one- page statement of educational objectives in lieu of item 1 above, and must also submit items 2,3 and 5 above. Students interested in the accelerated non- thesis Master of Science must have completed undergraduate courses in genetics and biochemistry.

Prospective students who are U.S. citizens or permanent residents must also apply for admission to NMSU through the Graduate School. Prospective students who are not in one of these two categories must apply through International Student and Scholar service.

Graduate Record Examination scores are not required by the Department, but if available the Department may use them to help assign the award of graduate assistantships to entering students. These assistantships are awarded based on departmental needs and student merit; in general they are reserved for Ph.D. and thesis Master of Science students, and are not available to non- thesis Master of Science students.

For the accelerated non- thesis Master of Science students, the courses are designed to prepare students for biotechnology- related careers in basic and applied research; in product development and testing; and in policy- making, regulation, and law enforcement. The program of study includes practical training in molecular biology, genomics and bioinformatics, statistical analysis, business, bioethics, and professional development skills. Additional graduate course work will provide students with further expertise in their individual areas of

interest, including cell, molecular, and microbial biology; environmental, ecological, and evolutionary biology; and general and integrative biology. Students who complete this training will be prepared for successful employment in academic, corporate, and government settings.

For other Master of Science studies and for the Ph.D., students can choose among the Department's three core programs of formal course work: Ecology and Evolutionary Biology, Cell and Organismal Biology, and Microbiology. Masters of Science thesis students and Ph.D. students in the Ecology and Evolutionary Biology core program should consult with their faculty advisor in developing a curriculum plan.

The Cell and Organismal Biology core program is appropriate for all graduate students who wish to emphasize those areas of biology that integrate function and structure in cells, tissues, and organisms. The graduate curriculum includes required and elective courses in cell and molecular biology, neurobiology, developmental biology, and physiology. Our goal is to prepare students for careers in this field through research experiences and formal coursework as well as through seminars and discussion groups.

The Microbiology core curriculum is appropriate for graduate students who wish to specialize in areas of biology that study the various processes that occur in microbes (bacteria, viruses, fungi, and protists) such as their physiology, ecology, development, or evolution. Students are expected to choose three 400-level microbiology courses and at least two 500- or 600-level courses to fulfill the graduate microbiology emphasis. Presentation of at least one formal seminar (i.e. an exit seminar) is expected.

Graduate students may also take a minor in other graduate departments and programs.

BIOLOGY

- BIOL 450. Special Topics 1-3 cr.
Specific subjects announced in the Schedule of Classes and offered as scheduled courses. May be repeated for unlimited credit.
- BIOL 451. Physiology of Microorganisms 3 cr.
Aspects of cellular physiology unique to prokaryotes. Prerequisites: C or better in BIOL 311 (or equivalent) and either BCHE 341 or BCHE 395 (or equivalent).
- BIOL 454. Biology of Respiration 3 cr.
How aquatic and terrestrial animals obtain oxygen and dispose of carbon dioxide. Includes respiratory-system structures and functions, gas-exchange and gas-transport mechanisms, and control systems. Emphasizes animals that live or travel in extreme environments. Prerequisite: BIOL 211G. BIOL 381 recommended.
- BIOL 462. Conservation Biology 3 cr.
Examination of the value of biological diversity, the natural processes that control biological diversity, and the ways in which human activities have resulted in the loss of biological diversity, both regionally and globally. Prerequisite: BIOL 301.
- BIOL 465. Invertebrate Zoology 4 cr. (3+3P)
Survey, ecology, behavior and physiology. Prerequisite: BIOL 111G or BIOL 190 and junior-level standing. BIOL 322 recommended.
- BIOL 466. Invertebrate Zoology Field Trip 1 cr.
A one-week field trip for the study of marine invertebrates. Registrants must provide own camping gear. Prerequisite: BIOL 465 or equivalent (or concurrent enrollment) or consent of instructor. Graded S/U.
- BIOL 467. Evolution 3 cr.
Covers theory, historical background, population variation, natural selection, adaptation, speciation. May not be offered spring semester, even-numbered years. Prerequisite: BIOL 111G or BIOL 190 and BIOL 305.
- BIOL 470. Developmental Biology 3 cr.
The purpose of this course is to introduce students to the principles that govern the development of a single fertilized egg cell into a complex multicellular organism. These principles, and often the molecular mechanisms by which they are accomplished, appear to be universal for all multicellular organisms including both plants and animals. We will explore issues such as: how cells become committed to particular cell fates and how this commitment is maintained; how organs acquire particular shapes, sizes and positions; the developmental causes of some human diseases; how the environment affects development; and, how changes in development provide the material basis for evolutionary change. Prerequisites: BIOL 211G, BIOL 305.
- BIOL 471. Molecular and Cellular Mycology 3 cr.
Exploration of the world of fungi with emphasis on fungal molecular biology and development. Including discussion of fungal taxonomy and genomics. Prerequisites: BIOL 311 required, BCHE 341 or BCHE 395 recommended, or

consent of instructor.

- BIOL 472. Primate Behavior and Ecology 3 cr.
Survey of the social behavior and ecology of nonhuman primates.
- BIOL 473. Ecology of Microorganisms 3 cr. (2+3P)
The metabolic interactions of microorganisms in the environment, with emphasis on their roles in ecological processes. Prerequisites: BIOL 311 or consent of instructor.
- BIOL 474. Immunology 3 cr.
Basic concepts of the immune response. Prerequisites: BIOL 305 and CHEM 211 or CHEM 313.
- BIOL 475. Virology 3 cr.
Mechanisms of viral infections of animals and man. Prerequisites: BIOL 311, and either BCHE 341 or BCHE 395.
- BIOL 476. Soil Microbiology 3 cr.
Same as SOIL 476.
- BIOL 476 L. Soil Microbiology Laboratory 1 cr. (3P)
Same as SOIL 476L.
- BIOL 477. Applied and Environmental Microbiology 4 cr.
A lecture-laboratory course on the microorganisms and the reactions they mediate which either impact the environment or have industrial applications. Reading of current literature will be emphasized. Topics include bioremediation, water quality, and aspects of industrial and food microbiology. Prerequisite: BIOL 311, and 311L, or consent of instructor.
- BIOL 478. Molecular Biology of Microorganisms 3 cr.
The biochemical basis for gene mutation, recombination, and expression with emphasis on prokaryotes. Includes fundamentals of recombinant DNA technology. Prerequisites: BIOL 305, BIOL 311, and either passage or concurrent enrollment in BCHE 341 and BCHE 395.
- BIOL 479. Medical Microbiology 3 cr.
An in-depth overview of microbial pathogens associated with human infectious disease. Etiological agents, pathogenesis, and processes leading to the disease state and the therapies of infectious disease. Prerequisite: BIOL 474 recommended.
- BIOL 479 L. Medical Microbiology Laboratory 1 cr.
Overview of common procedures used by medical microbiologists to identify agents of disease or microbial pathogen traits. Prerequisite: BIOL 479 or concurrent enrollment.
- BIOL 480. Animal Behavior 3 cr.
A survey of the field of animal behavior. BIOL 322 recommended. Prerequisite(s): BIOL 111G or BIOL 190 and junior-level standing.
- BIOL 480 L. Animal Behavior Laboratory 1 cr. (2P)
Laboratory and field experiences in animal behavior. Prerequisite(s): BIOL 111 or BIOL 190 and junior level standing. BIOL 322 recommended. Corequisite(s): BIOL 480.
- BIOL 482. Microbial Systematics 2 cr.
Systematics of prokaryotic organisms, and consideration of fungi and protists. Integration of morphological, biochemical, molecular, and genetic information in determining group relationships. Problems encountered when applying classic systematic principles to organisms without significant contribution of sexual reproduction. Prerequisites: BIOL 311 (or equivalent) and consent of instructor.
- BIOL 484. Animal Communication 3 cr.
An examination of how animals produce and perceive signals, what factors influence the form of signals in different sensory modalities, and how conflicts between senders and receivers affect signaling strategies. Weekly discussion from the primary literature and group research products.
- BIOL 488. Principles of Conservation Genetics 3 cr.
Fundamentals of the genetics of small populations. Genetic technologies used in studying small populations. Application of genetics and evolution to the conservation of biological populations. Prerequisite: BIOL 305.
- BIOL 489. Genetic Aspects of Population Biology 3 cr.
Basic theory of population genetics and how that theory has guided, and been influenced by, studies of natural populations. Prerequisite: BIOL 305 or equivalent.
- BIOL 490. Neurobiology 3 cr.
Fundamentals of neurobiology with an emphasis on properties of neurons and glia, principles of synaptic transmission, development of nervous system and organization of motor and sensory systems. Prerequisite: BIOL 211, BIOL 305, MATH 142G, or MATH 191G, and CHEM 211 or CHEM 313.
- BIOL 498. Biology Research Programs 1-3 cr.
Directed studies and research experiences, by arrangement with instructor. May be repeated for a maximum of 6 credits.
- BIOL 503. Advanced Primate Adaptation and Evolution 3 cr.
Advanced review of non-human primate adaptation and evolution.

- BIOL 503 L. Advanced Primate Adaptation and Evolution Laboratory 1 cr. (1P)
Laboratory with exercises on non-human primate adaptation and evolution.
- BIOL 506. Biological Electron Microscopy (f) 5 cr.
Principles and use of light microscope, transmission and scanning electron microscope; specimen preparation, thick and ultrathin sectioning, analysis of micrographs.
- BIOL 507. Plant Systematics 4 cr.
Principles and methods, classification, and identification of representative plant families. In addition student collections will emphasize independent identification of difficult groups. Prerequisite: BIOL 110. Not open to students who have taken BIOL 312 or equivalent.
- BIOL 508. Biology for Educators 3 cr.
Assists K-12 teachers in developing pedagogy and content knowledge in biology. The document "New Mexico Science Content Standards, Benchmarks, and Performance Standards" provides a focus for the content area covered and methodologies emphasized.
- BIOL 509. Biology Laboratory Workshop for Educators 3 cr. (3P)
Intensive laboratory experience in biology intended for educators.
- BIOL 510. Current Topics in Biology 2 cr.
Current progress in various biological disciplines. Review of pertinent primary biological literature and oral presentations by experts. May be repeated for a maximum of 6 credits. Graded S/U.
- BIOL 514. Plant Physiology 2 cr.
Same as EPWS 514. Prerequisites: BIOL 211G and CHEM 112G.
- BIOL 517. Seminar in Physiological Ecology 3 cr.
Discussion of original research literature on the physiological responses of organisms and their adaptive value in ecological settings. Examples of plants, animals, and microbes as suited to student interest. Prerequisite: consent of instructor.
- BIOL 520. Molecular Cell Biology 3 cr.
An in-depth look at cellular processes and structures at the molecular level. Emphasis is placed on formal student presentations and discussions of current literature. Prerequisite: BIOL 377 or equivalent.
- BIOL 522. Mechanisms of Fungal Pathogenicity 3 cr.
A detailed examination of fungal pathogens of animals and plants. Emphasis on primary literature, recent advances and student presentations. Prerequisite: BIOL 471 or BIOL 478 or equivalent or consent of instructor.
- BIOL 523. Mechanisms of Microbial Pathogenicity 3 cr.
Comparative study of various human pathogens, including bacteria, viruses and mycoplasma. Evaluation of effects and responses of the host to infection. Prerequisite: BIOL 479.
- BIOL 527. Symbiosis 3 cr.
In-depth treatment of the ecology, evolution, and mechanisms that are found in symbiotic systems. Prerequisite: graduate status.
- BIOL 528. Advanced Medical Microbiology 3 cr.
Up-to-date discussion and lectures by students on select microbial pathogens and associated disease states. Prerequisite: BIOL 479 and BIOL 479L.
- BIOL 530. Plant Physiology: Metabolism 3 cr.
Examination of major plant metabolic processes including photosynthesis, nitrogen metabolism, lipid and secondary plant product metabolism and investigation of how they are related. Emphasis on literature. Same as AGRO 530, EPWS 530, HORT 530, and MOLB 530. Prerequisites: BIOL 314, CHEM 314 or consent of instructor.
- BIOL 533. Environmental Physiology of Plants 3 cr.
Integral responses of plants and crop productivity to naturally occurring and modified environmental factors such as radiation, temperatures, water vapor, carbon dioxide, and air flow. Prerequisite: BIOL 314 or consent of instructor. Same as AGRO 533 and HORT 533.
- BIOL 534. Advanced Human Evolution 3 cr.
Advanced overview of human biological evolution from the emergence of Miocene apes to the modern human diaspora. Prerequisite: ANTH 355 or consent of instructor.
- BIOL 534 L. Advanced Human Evolution Laboratory 1 cr. (1P)
Advanced laboratory in human evolution, includes exercises and activities to learn the human fossil record.
- BIOL 540. Science and Ethics 1-3 cr.
Ethical concerns facing researchers in the basic and applied biological sciences. Coverage of responsible conduct in research including scientific integrity and research misconduct, mentor/trainee responsibilities, data management, authorship, publication practices, human subjects, animal welfare, intellectual property, conflicts of interest and effort and collaborative science. Emphasis on ethical reasoning skills. Discussion of ethical and societal implications of issues selected from a broad range of contemporary research areas (genetics, reproductive biology, environmental sciences, nanoscience, drug discovery, bioengineering, neuroscience).
- Subtitled. May be repeated for a maximum of 12 credits.
- BIOL 541. Professional Development Seminar 1-3 cr.
Practical aspects of career enhancement including job seeking, professional presentations, grant proposals, etc. Prerequisite: consent of instructor.
- BIOL 545. Molecular and Biochemical Genetics 3 cr.
Same as BCHE 545.
- BIOL 547. Advanced Ornithology (so) 4 cr. (3+3P)
Morphology, life histories, systematics, ecology, and behavior of birds. Independent project required.
- BIOL 550. Special Topics 1-3 cr.
Readings, discussions, and/or field and laboratory investigation of selected problems. Possible topics: human genetics, systematic entomology, or parasitism in animals. Prerequisite: consent of instructor, and designation of a specific topic before registration. May be repeated for unlimited credit.
- BIOL 557. Principles of Phylogenetic Inference 3 cr.
Foundation in the evolutionary and statistical concepts underlying the process of phylogenetic inference. Application of principles to practical problems derived from molecular biology, molecular evolution, ecology, conservation biology, evolution, and systematics.
- BIOL 560. Seminar in Cell and Organismal Biology 1-3 cr.
Oral presentation and discussion of journal articles and ongoing research project. May be repeated for a maximum of 6 credits.
- BIOL 561. Comparative Physiology Seminar 2 cr.
Discussion and readings in various aspects of animal physiology. Prerequisites: BIOL 381 or consent of instructor.
- BIOL 567. Individuals and Populations 3 cr.
Study of ecological systems at the levels of the individual and population. Topics include physiological responses of individuals to their environment, life history theory, and spatially-explicit models of population and metapopulation dynamics.
- BIOL 568. Communities and Ecosystems 3 cr.
Study of ecological systems at the levels of the community and ecosystem. Topics include species interactions, community structure and dynamics, and flow of material and energy through ecosystems.
- BIOL 570. Ecological Biogeography 3 cr.
Survey of modern theory incorporating ecological mechanisms governing distribution and abundance of species over space and time.
- BIOL 572. Advanced Primate Behavior and Ecology 3 cr.
Advanced review of non-human primate social behavior and ecology.
- BIOL 573. Fungal Biology 3 cr. (3+2P)
Same as EPWS 572. Prerequisites: EPWS 310 or BIOL 311, or consent of instructor.
- BIOL 574. Advanced Human Osteology 3 cr.
Advanced human osteology surveying the functional, developmental and evolutionary biology of the human skeleton. Identifying bones and teeth from hands-on experience with skeletal and dental material. Provides a foundation for human evolutionary studies, bioarchaeology and forensic anthropology.
- BIOL 574 L. Human Osteology Laboratory 1 cr. (2P)
Laboratory for BIOL 574 and ANTH 574. Experiences and activities related to identifying teeth and bones of the human skeleton.
- BIOL 577. Advanced Topics in Environmental Microbiology 3 cr.
Methods used in molecular ecology and the study of diverse microbial habitats such as the rhizosphere and animal rumen. Class participation expected. Prerequisite: BIOL 473, BIOL 477 or consent of instructor.
- BIOL 581. Physiology of Animals 3 cr.
Comprehensive treatment of integrative physiology of animals, emphasizing tissues, organ systems, and regulatory control, including neuroendocrine function, circulation, respiration, and excretion. Term paper required. Prerequisite: BIOL 211G. BIOL 111G, BIOL 377 recommended.
- BIOL 584. Animal Communication 3 cr.
How animals produce and perceive signals, what factors influence the form of signals in different sensory modalities, and how conflicts between senders and receivers affect signaling strategies. Weekly discussions from the primary literature and group research projects. Prerequisite: BIOL 439 or equivalent.
- BIOL 586. Molecular Systematics 3 cr.
Laboratory oriented course emphasizing the application of molecular biological techniques to traditional life, natural history, and evolutionary biology. Curriculum includes methods of DNA characterization as applied to pedigree analysis, phylogenetic estimation, and population genetics. Weekly discussion of assigned readings from primary literature. Prerequisite: consent of instructor.

- BIOL 587. Behavioral and Evolutionary Ecology** 3 cr.
This course will investigate the causes and consequences of phenotypic variation and the adaptive value of phenotypic traits.
- BIOL 588. Principles of Evolutionary Genetics** 3 cr.
Fundamentals of genetic properties of natural populations. Application of genetics to the study of evolutionary change.
- BIOL 589. Speciation and Adaptation** 3 cr.
Examination of the two great themes of evolutionary biology from the perspectives of paleontology, developmental biology, and genetics. Begins with an historical overview of research on these evolutionary processes, but moves rapidly into contemporary issues. Emphasis on empirical studies and the primary literature.
- BIOL 590. Advanced Neurobiology** 1-3 cr.
Detailed examination of the principles underlying nervous system organization and function. Emphasis on recent advances in multidisciplinary, integrated approaches to study the nervous system. Prerequisites: either BIOL 490, BIOL 520, or equivalent, and consent of instructor. May be repeated under different subtitles for a maximum of 9 credits.
- BIOL 591. Principles of Confocal Microscopy** 1 cr.
Introduction to confocal microscopy, including basic principles of fluorescence, lasers, confocal optics, sample preparation, image acquisition, and image processing.
- BIOL 592. Microscopy Practicum** 1-3 cr.
Advanced laboratory in specialized microscopy methods (histology, sem, tem, confocal, multi-photon, image processing, fluorescence). Prerequisite: consent of instructor. May be repeated for a maximum of 9 credits.
- BIOL 598. Special Research Programs** 1-9 cr.
Individual investigations either analytical or experimental.
- BIOL 599. Master's Thesis** 0-88 cr.
Thesis.
- BIOL 600. Doctoral Research** 1-88 cr.
Research.
- BIOL 610. Seminar** 1-3 cr.
Reviews of significant contributions from the zoological, botanical, and microbiological sciences to the broader aspects of biology. May be repeated for a maximum of 6 credits.
- BIOL 612. Microbiology Seminar** 1 cr.
Seminar to aid graduate students in assessment and presentation of classical and current topics in microbiology.
- BIOL 620. Advanced Studies in Microbial Physiology** 1-3 cr.
Special topics, lectures, and/or laboratory work in various specialties within the field of microbial physiology.
- BIOL 621. Advanced Studies in Plant Ecology** 1-3 cr.
Detailed appraisal of current theories and methods involving community and factorial plant ecology.
- BIOL 623. Advanced Studies in Plant Morphology** 1-3 cr.
Comparative investigations of internal and external structures of vascular plants, including ultrastructures.
- BIOL 627. Advanced Studies in Plant Physiology** 1-3 cr.
Seminars, lectures, and/or laboratory work in specialties in the field of plant physiology.
- BIOL 629. Advanced Studies in Plant Biosystematics** 1-3 cr.
Critical study of selected taxa.
- BIOL 631. Advanced Studies in Genetics** 1-3 cr.
Lectures, directed study, and discussions in current cytogenetic and cytotoxic research.
- BIOL 633. Advanced Studies in Cell Biology** 1-3 cr.
Lectures, seminars, or laboratory research on eukaryotic cell biology or viruses.
- BIOL 634. Advanced Studies in Medical Microbiology** 1-3 cr.
Lectures, seminars, discussions, or laboratory research dealing with disease-causing microorganisms. Prerequisites: BIOL 479 or equivalent and consent of instructor.
- BIOL 639. Advanced Studies in Soil Microbiology** 1-3 cr.
Analysis of microbiological balances in natural soils as affected by physical factors of the soil, crop exudates and residues and other organisms.
- BIOL 640. Advanced Studies in Animal Physiology** 1-3 cr.
Lectures, seminars, discussions, or laboratory research in animal physiology.
- BIOL 641. Advanced Studies in Animal Ecology and Evolution** 1-3 cr.
Lectures, directed study, and discussions of such topics as population theory, species diversity, biosystematics, ethology, genetics of speciation, and other aspects of evolutionary biology.

- BIOL 645. Advanced Studies in Ecosystem Analysis** 1-3 cr.
Lectures, directed study, discussion, and modeling of ecosystem structure and function.
- BIOL 648. Advanced Studies in Arthropod Ecology** 1-3 cr.
Lectures, seminars, and/or laboratory work dealing with physiological, population, and/or community ecology of arthropods.
- BIOL 697. University Teaching Experience** 1-3 cr.
Certain graduate students will be permitted to teach up to one-third of one of the biology courses. The student will prepare and deliver lectures and will prepare, administer, and grade at least one examination. The professor in charge of the course will attend and evaluate the student's lectures.
- BIOL 698. Selected Topics** 1-3 cr.
Selected topics for doctoral students.
- BIOL 700. Doctoral Dissertation** 0-88 cr.
Dissertation.

GENETICS

- GENE 450. Special Topics** 1-3 cr.
Specific subjects to be announced in the schedule of classes. Maximum of 3 credits per semester and a total of 3 credits toward a degree. Consent of instructor required.
- GENE 452. Applied Bioinformatics** 3 cr.
Survey and application of publicly available bioinformatic tools that treat genomic DNA, cDNA, and protein sequences, RNA abundance, as well as tools that allow inference based on phylogenetic relationships. Prerequisites: AGRO/ANSC/BIOL/HORT 305 or GENE 315 and GENE 320, and BCHE 341, or BCHE 395.
- GENE 486. Genes and Genomes** 3 cr.
Extensive coverage of nuclear and organelle genome structure in plants and animals, genome restructuring including duplication, aneuploidy, chromosome translocations and inversions, comparative genomics, and molecular systematics. Prerequisites: AGRO/ANSC/BIOL/HORT 305 or GENE 315, and GENE 320.
- GENE 488. Gene Regulation** 3 cr.
Extensive coverage of signal transduction processes and approaches used to monitor large scale changes in gene regulation and protein synthesis that occur during development and in response to environmental changes. Prerequisites: AGRO/ANSC/BIOL/HORT 305 or GENE 315.

CHEMISTRY AND BIOCHEMISTRY

Department website: <http://www.chemistry.nmsu.edu/>
(575) 646-2505
johnson@nmsu.edu

M. D. Johnson, department head, Ph.D. (New Mexico State University)-inorganic chemistry: kinetics, reaction mechanisms of transition metal complexes; J.B. Arterburn, Ph.D. (Arizona)-organic chemistry, enantioselective and metallo-organic synthesis; G. A. Eiceman, Ph. D. (Colorado-Boulder)-analytical chemistry: gas and liquid chromatography, mass spectrometry; A. Gopalan, Ph.D. (Ohio State University)-organic chemistry: synthetic methods, applications of enzymes in asymmetric synthesis; J. W. Herndon, Ph.D. (Princeton)-organic chemistry; organo-transition metal complexes, synthesis of biologically important cyclic compounds; K. Houston, Ph.D. (University of Texas- MD Anderson)- biochemistry, molecular mechanisms of hormone action in tumorigenesis; G. D. Kuehn, Ph.D. (Washington State University)-biochemistry: role of polyamine metabolism in oxidative stress and apoptosis; siRNA knock-down strategies; A. S. Lara, Ph.D. (New Mexico State University)-analytical chemistry: exploitation of clays for remediation of environmental pollutants; S. L. Lusetti, Ph.D. (Wisconsin)-biochemistry: cell metabolism, disease etiology; B. A. Lyons, Ph.D. (Cornell University)-biochemistry: nmr spectroscopic studies of signal transduction pathways in breast cancer; W.A. Maio, Ph.D. (Johns Hopkins University)-organic chemistry; synthesis of lactones and lactams, artemisinin- based anti-malarial dimers, and total synthesis of (+)-iriomoteolide 1a; W. Quintana, Ph.D. (Pennsylvania)-inorganic chemistry, boron chemistry, chemical education; G. D. Rayson, Ph.D. (Texas-Austin)-analytical chemistry: spectroscopy; A. Rowland, Ph.D. (University of Utah)-toxicology; in vitro mechanisms of toxicology related to Cyp2S1 gene expression in epithelial disease; S. N. Smirnov, Ph.D. (Novosibirsk)-physical chemistry: photo-induced charge separation; D. E. Smith, Ph.D. (California-Berkeley)-physical chemistry: molecular dynamics in condensed phase; J. M. Smith, Ph.D. (University of Witwatersrand)-inorganic chemistry: synthetic

models of metalloenzyme active sites, small molecule activation; H. Wang, Ph.D. (Wayne State)-physical chemistry: reaction kinetics in complex systems; C. G. Zoski, Ph.D. (Trent University, Canada)-analytical chemistry: theoretical and experimental electrochemistry.

DEGREE: Master of Science
MAJOR: Chemistry

DEGREE: Doctor of Philosophy
MAJOR: Chemistry

MINOR: Biochemistry
MINOR: Chemistry

The Department of Chemistry and Biochemistry offers programs leading to the M.S. and Ph.D. degrees in the areas of physical, organic, inorganic, biological, and analytical chemistry. Admission to these programs without deficiency is based on an undergraduate program essentially equivalent to that pursued by a chemistry or biochemistry major at this university. An entering student is encouraged to take the Graduate Record Examination (aptitude) to increase his or her chances for financial support. All foreign students must take GRE and TOEFL and must demonstrate adequate English speaking and writing skills.

Students who wish may take a minor in chemical toxicology or molecular biology. The core course work required of students entering with no previous graduate study in chemistry or biochemistry consists of basic core courses completed in one of the following options: (i) two courses chosen respectively from two of the five major areas represented in the department apart from a student's elected field of thesis research; or (ii) one course chosen from the five major areas apart from the student's elected field of thesis research plus one graduate-level course in a discipline outside the Department of Chemistry and Biochemistry. A master's candidate will plan an appropriate program of further study with his or her advisor and is also required to prepare a thesis. The thesis requirement may be waived upon application to the department head, after completion of the doctoral comprehensive examination requirements. A chemistry student who successfully completes the Ph.D. qualifying examination will begin writing the cumulative examinations, which constitute the written portion of the comprehensive examination. A biochemistry student who successfully completes the Ph.D. qualifying examination will begin preparation of a research proposal which will be orally defended for completion of the comprehensive examination. After completion of the qualifying exam, a doctoral committee is formed to assist the student in planning a program appropriate to his or her background and goals. Since research is central in both the master's and doctoral programs, the early selection of a research advisor is encouraged. The student is expected to participate in the colloquia and seminar programs. Financial support is available to graduate students in chemistry and biochemistry through numerous teaching and research assistantships as well as federally supported traineeships and fellowships. Inquiries regarding these opportunities should be directed to the head of the department.

CHEMISTRY

CHEM 451. Special Topics	1-3 cr.
Specific subjects to be announced in the Schedule of Classes. Prerequisite: consent of instructor. May be repeated for a maximum of 12 credits.	
CHEM 452. Integrated Advanced Laboratory	3 cr.
Applications of the principles of organic, inorganic, physical, and analytical chemistry to solve particularly defined but open-ended problems in chemistry. Prerequisites: CHEM 315, CHEM 356, CHEM 371, CHEM 433.	
CHEM 452 H. Integrated Advanced Laboratory Honors	3 cr. (1+6P)
Same as CHEM 452. Additional work to be arranged.	
CHEM 455. Independent Studies	1-3 cr.
Independent studies directed by consulting faculty. Prerequisite: consent of instructor.	
CHEM 456. Inorganic Structure and Bonding	3 cr.
Theoretical principles and a systematic study of the periodic table. Prerequisite: CHEM 356 or CHEM 431 or CHEM 433.	
CHEM 456 H. Inorganic Structure and Bonding Honors	3 cr.
Same as CHEM 456. Additional work to be arranged.	
CHEM 466. Advanced Organic Chemistry	3 cr.
Recent developments in synthesis and theoretical principles of organic chemistry. Prerequisite: CHEM 314.	
CHEM 466 H. Advanced Organic Chemistry Honors	3 cr.
Same as CHEM 466. Additional work to be arranged.	

CHEM 471. Instrumental Methods of Analysis	4 cr. (3+3P)
Analytical techniques, including optical and procedures. Prerequisites: CHEM 371 and either PHYS 212G or PHYS 216G.	
CHEM 472. Analytical Methods for Toxic Organics and Metal Ions in the Environment	3 cr. (2+3P)
Laboratory course with lectures on principles of analytical techniques related to environmental monitoring of pollutants and waste management. Prerequisite: CHEM 371 or C E 462 or consent of instructor.	
CHEM 500. Seminar in Inorganic Chemistry	1 cr.
Current topics. May be repeated.	
CHEM 505. Chemistry for Educators	3 cr.
Assists K-12 teachers in the development of pedagogy and content knowledge in the area of chemistry. Addresses New Mexico benchmarks and standards.	
CHEM 506. Atomic and Molecular Structure in Inorganic Chemistry	3 cr.
Theories of ionic and molecular bonding.	
CHEM 507. Chemistry of the Elements	3 cr.
Discussion of the reactions and structures of inorganic compounds.	
CHEM 508. Main Group Chemistry	3 cr.
Chemistry, structure and bonding of main group elements are covered along with some spectroscopy.	
CHEM 509. Transition Metal Chemistry	3 cr.
The chemistry, bonding theory, spectroscopy and industrial applications of the transition metals will be covered.	
CHEM 510. Seminar in Organic Chemistry	1 cr.
Current topics. May be repeated.	
CHEM 514. Organic Structure Determination	3 cr.
Modern spectroscopic techniques for characterization of organic compounds.	
CHEM 515. Modern Organic Chemistry	3 cr.
Recent developments in synthesis and theoretical principles of organic chemistry.	
CHEM 516. Physical Organic Chemistry	3 cr.
Physical organic chemistry.	
CHEM 517. Synthetic Organic Chemistry	3 cr.
Synthetic methods in organic chemistry.	
CHEM 518. Chemistry for Educators	3 cr.
This is a course for Graduate Masters of Arts in teaching.	
CHEM 520. Seminar in Analytical Chemistry	1 cr.
Current topics. May be repeated.	
CHEM 521. Chemical Instrumentation	3 cr. (2+3P)
Theory and application of electronic devices to chemical analysis.	
CHEM 526. Advanced Analytical Chemistry	3 cr.
Equilibria, and the theories of gravimetric, volumetric, and instrumental analysis.	
CHEM 527. Separations	3 cr.
Covers the fundamentals of separation methods and relationships to modern analytical techniques such as gas chromatography and liquid chromatography.	
CHEM 528. Electroanalytical Techniques	3 cr.
Theory and application of modern electrochemical methods of analysis including voltammetry, amperometry, modern cyclic and pulse methods, and stripping analysis.	
CHEM 529. Spectrochemical Analysis	3 cr.
Fundamentals, instrumentation, and applications of spectrochemical analysis.	
CHEM 530. Seminar in Physical Chemistry	1 cr.
Current topics. May be repeated.	
CHEM 536. Chemical Thermodynamics	3 cr.
First, second, and third laws of thermodynamics, and the concepts, interrelations, and applications of thermodynamic state functions.	
CHEM 537. Quantum Chemistry	3 cr.
Fundamentals of quantum mechanics. Prerequisite: consent of instructor.	
CHEM 538. Chemical Kinetics	3 cr.
Empirical analysis of rate measurements, collision theory, transition state theory, and chain reactions.	
CHEM 539. Spectroscopy	3 cr.
Molecular spectroscopy for physical chemistry. Quantum mechanics applied to spectroscopy of polyatomic molecules: UV-VIs, IR, magnetic resonance. CHEM 537 desired but not required. Prerequisite: consent of instructor. Prerequisite: consent of instructor.	
CHEM 540. Seminar in Environmental Chemistry	1 cr.
Current topics in environmental chemistry. May be repeated for a maximum of 3 credits.	

CHEM 550. Discussions in Inorganic Chemistry	1 cr.
Current research problems in inorganic chemistry. May be repeated. Graded S/U.	
CHEM 560. Discussions in Organic Chemistry	1 cr.
Current research problems in organic chemistry. May be repeated. Graded S/U.	
CHEM 570. Discussions in Analytical Chemistry	1 cr.
Current research problems in analytical chemistry. May be repeated. Graded S/U.	
CHEM 580. Discussions in Physical Chemistry	1 cr.
Current research problems in physical chemistry. May be repeated. Graded S/U.	
CHEM 590. Discussions in Environmental Chemistry	1 cr.
Current research problems in environmental chemistry. May be repeated for a maximum of 3 credits. Restricted to majors. Graded S/U.	
CHEM 598. Special Research Programs	1-3 cr.
Individual investigations, either analytical or experimental. Graded S/U.	
CHEM 599. Master's Thesis	0-88 cr.
Thesis preparation.	
CHEM 600. Research	1-88 cr.
Course used for assigning credit for research performed prior to successful completion of the doctoral qualifying examination.	
CHEM 606. Physical Methods in Inorganic Chemistry	3 cr.
Application of symmetry properties and techniques such as NMR, ESR, IR, visible, UV, ORD, and CD spectroscopy to inorganic problems.	
CHEM 609. Topics in Inorganic Chemistry	1-3 cr.
Selected topics of current interest designated by subtitle.	
CHEM 619. Topics in Organic Chemistry	1-3 cr.
Selected topics of current interest designated by subtitle.	
CHEM 629. Advanced Topics in Analytical Chemistry	3 cr.
Discussion of advanced topics in the field of analytical chemistry. May be repeated with different subtitles. Consent of instructor required.	
CHEM 639. Topics in Physical Chemistry	1-3 cr.
Selected topics of current interest designated by subtitle.	
CHEM 650. Advanced Seminar	1 cr.
Intended for students who have earned a master's degree or the equivalent. A discussion of current topics of interest in chemistry. May be repeated.	
CHEM 700. Doctoral Dissertation	0-88 cr.
Dissertation preparation.	

BIOCHEMISTRY

BCHE 451. Special Topics	1-3 cr.
Same as CHEM 451. Prerequisite: consent of instructor. May be repeated for a maximum of 12 credits.	
BCHE 455. Independent Studies	1-3 cr.
Independent studies directed by consulting faculty. Prerequisite: consent of instructor.	
BCHE 494. Techniques in Genetic Engineering	4 cr. (2+6P)
Basic laboratory techniques required for research involving recombinant DNA technology: structured experimental procedures, including nucleic acid isolation and purification, as well as the identification and manipulation of genes and genetic material of both bacterial and plant origin. Prerequisites: BCHE 395, 396, and consent of instructor.	
BCHE 540. Seminar in Biochemistry	1 cr.
Formal seminar presentation in current topics in biochemical research. May be repeated for a maximum of 3 credits.	
BCHE 542. Biochemistry I	3 cr.
Relationship between macromolecular structure and function. Basic enzymology. Energy metabolism. Prerequisite(s): CHEM 314 and CHEM 431 or CHEM 433; or BCHE 395 or equivalent.	
BCHE 545. Molecular and Biochemical Genetics	3 cr.
An accelerated treatment of the molecular basis of gene expression. Discussion of chemical, enzymological, and genetic techniques of molecular biology. Prerequisite: BCHE 542 or equivalent. Same as BIOL 545.	
BCHE 546. Biochemistry II	3 cr.
Intermediary metabolism: catabolic and anabolic pathways of carbohydrates, lipids, amino acids, and nucleic acids, including their regulation. Prerequisite: BCHE 542 or BCHE 395 with consent of instructor.	
BCHE 590. Discussions in Biochemistry	1 cr.
Current research problems in biochemistry. May be repeated for a maximum of 6 credits. Graded S/U.	
BCHE 598. Special Research Programs	1-3 cr.
May be repeated for a maximum of 6 credits. Same as CHEM 598. Graded	

S/U.

BCHE 599. Master's Thesis	0-88 cr.
May be repeated for a maximum of 6 credits. Same as CHEM 599.	
BCHE 600. Research	1-88 cr.
May be repeated for a maximum of 20 credits. PR/U grading. Same as CHEM 600.	
BCHE 645. Nucleic Acid Metabolism	3 cr.
Study of the enzymology of proteins that act on nucleic acids as well as the effect of DNA and RNA structure on metabolic processes. Taught with BCHE 451. Prerequisite(s): 'C' or better in BCHE 395 or BCHE 542.	
BCHE 647. Physical Biochemistry	3 cr.
Fundamental applications of physical chemistry to the investigation of biological metabolites and biological macromolecules, including proteins, oligo-nucleotides, and molecular arrays with an emphasis on understanding biological functions based on chemical structures. Taught with BCHE 451. Prerequisite(s): 'C' or better in CHEM 431 or CHEM 433 or BCHE 542.	
BCHE 648. Proteins and Enzymes	3 cr.
Theories and mechanisms of enzyme catalysis, chemical modification of proteins, general acid-base catalysis and nucleophilic catalysis as they pertain to enzymes, advanced enzyme kinetics, and formulation of enzymatic rate equations. Prerequisite: BCHE 546.	
BCHE 649. Topics in Biochemistry	1-3 cr.
Selected topics of current interest designated by title and credit. May be repeated for a maximum of 3 credits.	
BCHE 650. Advanced Seminar	1 cr.
Discussion of biochemical research in progress that relates to a doctoral candidate's thesis research. Intended for students who have earned a master's degree or the equivalent and has made significant research progress for preparation of the doctoral dissertation. May be repeated for a maximum of 3 credits.	
BCHE 700. Doctoral Dissertation	0-20 cr.
May be repeated for a maximum of 20 credits. Graded PR/U. Same as CHEM 700.	

TOXICOLOGY

Industry, as well as federal, state, and municipal government agencies, has a growing need for scientists and engineers with an understanding of toxicological problems. The Toxicology Program has been designed to provide instruction in general, environmental, and occupational toxicology for students majoring in areas of science, agriculture, or engineering. Master's or doctoral students may minor in toxicology by completing the introductory course and at least two of the advanced courses.

TOX 453. Regulatory Toxicology	2 cr.
Laws and regulations governing production, use and disposal of toxic or hazardous materials. Prerequisite: consent of instructor. Same as E S 453.	
TOX 461. Toxicology I	3 cr.
Introduction to principles of toxicology. Prerequisite(s): BIOL 111G or BIOL 211G, and CHEM 345. Crosslisted with: ANSC 461	
TOX 523. Environmental Toxicology	3 cr.
Introduction to the science of environmental toxicology. This course examines common pollutants and their impact on human and environmental health. It also evaluates the role of environmental protection agencies in monitoring and regulating these substances. Prerequisite(s): CHEM 211 or CHEM 313-314.	
TOX 550. Special Topics	1-3 cr.
Readings, discussions, and/or field and laboratory investigation of selected problems. Typical examples: pharmacology, reproductive toxicology, environmental toxicology, or mutagenesis. Prerequisite: consent of instructor, and designation of a specific topic before registration.	
TOX 598. Special Research Programs	1-3 cr.
Individual investigations, either analytical or experimental. Graded S/U.	

COMMUNICATION STUDIES

Department website: <http://web.nmsu.edu/~nmsucomm/>
(575) 646-2801
ahubbell@ad.nmsu.edu;

Anne Hubbell, Department Head, Ph.D. (Michigan State)-organizational communication, health communication; G. Armfield, Ph.D. (University of Missouri—Columbia)-organizational communication, communication theory; J. Flora, Ph.D. (Kansas)- communication; K. L. Hacker, Ph.D. (Oregon)-computer mediated

communication, political communication; E. Morgan, Ph.D. (University of Massachusetts)- communication and culture

DEGREE: Master of Arts
MAJOR: Communication Studies

MINOR: Communication Studies

The Master of Arts in Communication Studies provides students with a social scientific approach to the study of human interaction, using quantitative and qualitative methods. Our curriculum is designed to explore how oral communication takes place interpersonally, within organizations, within our political system, and between and within cultures. Students take courses in interpersonal communication, organizational communication, political communication and/or cultural communication. All graduate students take courses in communication theory and research methods. In addition, students can take courses in topic areas such as conflict management, small group communication, persuasion, and nonverbal communication.

The program offers a wide variety of courses allowing students an opportunity to select topics pursuant to their special interests. In addition to courses, students have the opportunity to obtain practical experience by participating in professional activities offered by the department; for example, graduate teaching assistantships, research, and colloquia.

DEGREE: Master of Arts
MAJOR: Communication Studies

The department offers both thesis and non-thesis options in its Masters of Arts program. Both options require a minimum of 36 credits, which includes not only Communication courses but courses from outside the department. The thesis option requires at least 30 credits of coursework, 3-6 credits of thesis (COMM 599), and an oral defense of the thesis and coursework. The non-thesis option requires 36 credits of coursework, plus a comprehensive written examination, followed by an oral defense. Both options require a minimum of 30 credit hours of Communication courses.

DEGREE REQUIREMENTS

Both of the following courses are required:	
COMM 505, Research Methods*	3
COMM 583, Seminar in Theories of Communication**	3
Total	6
Students must take <i>three</i> of the following four courses:	
COMM 540, Seminar in Political Communication**	3
COMM 570, Seminar in Organizational Communication*	3
COMM 576, Seminar in Communication and Culture *	3
COMM 584, Seminar in Interpersonal Communication**	3
Total	9
COMM electives.....	9-15
Electives in Related Fields*** (graduate levels; numbered 450+)	3-6
Thesis Option: COMM 599, Thesis	3-6
Non-thesis Option: Additional Graduate COMM Electives	3-6
Total in COMM	30
Grand Total	36(min)
*COMM 505, 570, & 576 are offered only once every year, usually in the Spring.	
** COMM 583, 540, & 584 are offered only once every year, usually in the Fall.	
*** Anthropology, Education, English, Government, Psychology, Journalism, Management, Marketing, Sociology, &/ or Women's Studies.	

ENGLISH AS A SECOND LANGUAGE

SPCD 451. Intensive English as a Second Language I	3-18 cr.
Instruction in speaking, reading, and writing basic conversational English. Class meets 30 hours weekly. Enrollment limited to beginning level graduate students in the International Intensive English Program. Consent of instructor required.	
SPCD 452. Intensive English as a Second Language II	3-18 cr.
Continuation of SPCD 401. Class meets 20 hours weekly. Enrollment limited to intermediate-level graduate students in the International Intensive English Program. . Consent of instructor required.	
SPCD 453. Intensive English as a Second Language III	3-18 cr.
Writing and speaking scientific English. Class meets 10 hours weekly, with	

additional laboratory hours at the instructor's discretion. Enrollment limited to advanced-level graduate students in the International Intensive English Program. Consent of instructor required. Prerequisite(s): SPCD 402 or consent of instructor.

SPCD 458. Advanced Speaking and Listening for International Graduate Students	3 cr.
Advanced speaking and listening skills for active participation at the graduate level. Emphasis on pronunciation and individual goal setting. Includes a theoretical component involving library research or preparation and presentation of a teaching unit. Prerequisites: placement and 530 TOEFL or consent of instructor. Graded S/U, RR.	
SPCD 460. Intermediate ESL Composition and Grammar	3 cr.
Development of fluent academic writing skills, with an emphasis on grammar review for editing purposes. Prerequisite(s): Placement based on English language screening test, and either a minimum TOEFL score of 500 or consent of instructor.	
SPCD 470. Scholarly Writing for International Graduate Students	3 cr.
Instruction and practice in writing major academic genres, including experimental, descriptive, and problem-solution research reports, proposals, and library referenced papers. Prerequisites: placement based on English language screening test or successful completion of SPCD 110; a minimum TOEFL score of 500 or consent of instructor; and successful completion of SPCD 108/490 where indicated by placement. Graded S/U.	
SPCD 490. Seminar Skills for Foreign Students	3 cr.
Advanced skills required for active participation in academic discussions and oral presentations. Includes extensive video-taping which is replayed for evaluation. Prerequisite: placement based on English language screening test, and a minimum TOEFL score of 500 or consent of instructor.	

COMMUNICATION STUDIES

COMM 450. Technologies of Human Communication	3 cr.
Development and evolution of human communication technologies from prehistory through the future of computer-mediated communication networks. Examines behavioral, cognitive, social, cultural, and political issues of new communication technologies and their use and management. Prerequisite: junior or senior standing.	
COMM 455. Fundamentals of Communication and National Security	3 cr.
This course addresses communication perspectives informing national security, strategic intelligence, and the intelligence process. Students will examine U.S. national security history, policy, the development of the Intelligence Community, and intelligence as processes of communication. This course serves as an introduction to national security studies.	
COMM 456. Communication and the Intelligence Cycle	3 cr.
The course addresses communication requirements and the technical, cognitive, and cultural complexity of the collaborative research environment. Students participate in novel, team-based problem scenarios that provide the foundation for acquiring advanced cognitive analytic methods and strategies. Students will engage in interdisciplinary information science processes and will develop and present analytic products responding to national security requirements.	
COMM 457. Strategic Communication and Public Diplomacy	3 cr.
This course covers history, theory, and research related to the use of communication to change attitudes in favor of U.S. national security interests. Students will examine the use of strategic communication and influence in diplomacy, intelligence, and military communities in terms of specific strategies, effects, and issues. Students will learn to distinguish public diplomacy, information operations, public affairs, and other forms of political communication that are used by the U.S. government to persuade target populations about American interests and goals. Topics include soft power, intelligence-based negotiation processes, and research methods used to identify influence techniques or groups that threaten U.S. national security.	
COMM 458. Intercultural Communication and National Security	3 cr.
This course provides a concentration on cultural factors in international affairs and conflicts, how culture affects perceptions of national interests, and the relationship of U.S. national security to understand the general and political cultures of other nations. Students will integrate cultural and intercultural communication theory and behavior, with an emphasis on the development of specific communication skills to facilitate developing cultural knowledge in government and political contexts. Students will learn how to study the cultural factors that affect international conflicts and how strategic communication should address such cultural factors.	
COMM 460. Deception and Communication	3 cr.
Deceptive communication including nonverbal indicators of lies, types of lies, and influence of relationships on lying behavior and interpretation.	

- COMM 462. Family Communication** 3 cr.
A communication perspective on traditional and nontraditional family configurations, roles, interaction patterns, and conflict. Includes an examination of media depictions of families and family interaction, as well as current social and political issues related to the family. Same as WS 462 and FCS 462.
- COMM 463. Communication and Gender** 3 cr.
Study of communication, gender and culture, including theoretical approaches to gender development, the implications of gender identity, gendered patterns of verbal and nonverbal communication, and the rhetorical dimensions of gender. Discussion of gendered communication in the workplace, as well as the influence of media on gender. Same as WS 463.
- COMM 465. Nonverbal Communication** 3 cr.
Study of and experimentation with nonverbal aspects of human communication as vital components of the total communication process.
- COMM 470. Leadership Communication** 3 cr.
Examination of traditional theories and concepts of leader-follower dynamics; presentation of cognitive, systems, and symbolic interpretative views of leadership with an emphasis on persuasion and motivation in leader-follower interactions.
- COMM 473. Interpersonal Problems in the Organization** 3 cr.
Explores the connection between the interpersonal and organizational contexts. Prerequisites: COMM 370 and COMM 384.
- COMM 475. International Communication** 3 cr.
Exploration of the forms and channels of communication substantially influenced by international cultural and political factors. Covers: global communication technology; news, information and entertainment flows; international diplomacy and negotiation, communication in war and peace.
- COMM 477. Environmental Communication** 3 cr.
Examines the link between communication and environment within the context of communication scholarship. Topics include sense of place, cultural approaches to interacting with environment as well as exploring current themes surrounding environment.
- COMM 480. Health Communication** 3 cr.
Examination of central issues in communication theory and practice as applied to health care. Includes communication in health care organizations, media dissemination of health information, role of communication in disease prevention and health promotion, and symbolic meaning of illness within cultures.
- COMM 483. Communication in Friendships and Romantic Relationships** 3 cr.
Examines communication in adult friendships and romantic relationships that do not have legal commitments. Includes trends in friendships, benefits and problems within cross and same-sex friendships and romances, gender differences in communication within adult friendships and romances and the communication of friendship and romance on the Internet. Prerequisite: COMM majors or consent of instructor.
- COMM 484. Verbal Communication** 3 cr.
Examination of rules governing conversational structures such as speech acts, action sequences, topics and topic shifts. Also covers humor in conversation and conversational control.
- COMM 485. International Teaching Assistant Development** 3 cr.
International teaching assistants will receive instruction in communicative skills to enable them to meet their responsibilities at NMSU. Course includes lectures, seminars, video-taped presentations, and tutorial sessions emphasizing pedagogic and presentation skills and styles. Prerequisite: consent of instructor.
- COMM 490. Independent Study** 1-3 cr.
Individualized, self-paced projects for advanced students. Prerequisites: COMM 265G and junior standing with consent of participating instructor. May be repeated for a maximum of 6 credits.
- COMM 491. Selected Topics** 1-6 cr.
Individual and/or group study of selected topics. To be identified by subtitle. Prerequisite: prior arrangement with faculty supervisor(s). May be repeated for a maximum of 12 credits.
- COMM 495. Communication Internship** 3 cr.
Internship opportunity to apply what has been learned to a real-world situation. Prerequisite: junior standing and 3.0 GPA in major. May be repeated for a maximum of 6 credits. Restricted to majors.
- COMM 505. Research Methods** 3 cr.
COMM 506. Qualitative Research Methods in Communication 3 cr. Survey of qualitative research methods in the study of human communication, including historical and critical approaches, interviewing, participant-observation, and communication ethnography. Students apply methods to their own research.
- COMM 506. Qualitative Research Methods in Communication** 3 cr.
Survey of qualitative research methods in the study of human communication, including historical and critical approaches, interviewing, participant-observation, and communication ethnography. Students apply methods to their own research.
- COMM 535. Seminar in Psychology of Human Communication** 3 cr.
Advanced study of psychological processes involved in interpersonal communication. Covers person perception and message production.
- COMM 540. Seminar in Political communication** 3 cr.
Political communication theory, research, and issues. Empirical studies of campaigns, movements, news media, voter decision-making, political participation, socialization, and knowledge. Political theory, field research, communication science findings and research methods.
- COMM 545. Seminar in Ethicism, Racism, and Communication** 3 cr.
Course focuses on theories and research concerning the social, cognitive, and communication aspects of ethnic and racial prejudice. Specific psychological and communication processes of person and group categorization are explored along with findings about the effects of ethnic prejudice on everyday communication (and vice versa).
- COMM 550. Seminar in Communication Technologies** 3 cr.
Seminar on design, usage, and social impact of electronic mail, communication through computer networks, and new technologies of organizational communication such as group decision support systems (GDSS). Each student will study an actual application of a major communication technology in an organization.
- COMM 551. Seminar in Persuasion** 3 cr.
Work with an actual persuasion campaign, such as public information, political, or commercial marketing campaigns. Includes case studies of large-scale persuasion efforts, current theoretical models of persuasion processes, and methods for studying, evaluating, and refining messages for optimal effects. Prerequisite: COMM 351 or consent of instructor.
- COMM 555. Seminar Fundamentals of Communication and National Security** 3 cr.
This seminar course addresses communication perspectives informing national security, strategic intelligence, and the intelligence process. Students will examine U.S. national security history, policy, the development of the Intelligence Community, and intelligence as processes of communication. This course serves as an introduction to national security studies. Graduate students are required to fulfill advanced research and presentation requirements.
- COMM 556. Seminar Communication and the Intelligence Cycle** 3 cr.
This seminar course addresses communication requirements and the technical, cognitive, and cultural complexity of the collaborative research environment. Students participate in novel, team-based problem scenarios that provide the foundation for acquiring advanced cognitive analytic methods and strategies. Students will engage in interdisciplinary information science processes and will develop and present analytic products responding to national security requirements. Graduate students will be required to fulfill advanced research and presentation requirements.
- COMM 557. Seminar Strategic Communication and Public Diplomacy** 3 cr.
The seminar course covers history, theory, and research related to the use of communication to change attitudes in favor of U.S. security interests. Students will examine the use of strategic communication and influence in diplomacy, intelligence, and military communities in terms of specific strategies, effects, and issues. Students will learn to distinguish public diplomacy, information operations, public affairs, and other forms of political communication that are by the U.S. government to persuade target populations about American interests and goals. Topics include soft power, intelligence-based negotiation processes, and research methods used to identify influence techniques of groups that threaten U.S. national security. Graduate students will be required to fulfill advanced research and presentation requirements.
- COMM 558. Seminar Intercultural Communication and National Security** 3 cr.
The seminar course provides a concentration on cultural factors in international affairs and conflicts, how culture affects perceptions of national interests, and the relationship of U.S. national security to understand the general and political cultures of other nations. Students will integrate cultural and intercultural communication theory and behavior, with an emphasis on the development of specific communication skills to facilitate developing cultural knowledge in government and political contexts. Students will learn how to study the cultural factors that affect international conflicts and how strategic communication should address such cultural factors. Graduate students will be required to fulfill advanced research and presentation requirements.
- COMM 570. Seminar in Organizational Communication** 3 cr.
Communication strategies and patterns of private and governmental organizations, including research on communication systems.

COMM 576. Seminar on Communication and Culture	3 cr.
Cultural and intercultural communication theory and research. Focuses on discovering and describing distinctive ways of speaking within and between cultures.	
COMM 577. Seminar in Conflict Management	3 cr.
Advanced examination of communication strategies to manage and negotiate conflict in intrapersonal, interpersonal, group, and organizational settings.	
COMM 583. Seminar in Theories of Communication	3 cr.
Communication systems, symbolic processes, analysis of messages.	
COMM 584. Seminar in Interpersonal Communication	3 cr.
Theories of interpersonal communication and communication within a relationship, including study of relevant models, contexts, and constructs.	
COMM 590. Independent Study	1-6 cr.
Individualized, self-paced projects. Prerequisite: consent of instructor.	
COMM 591. Special Topics	1-9 cr.
Individual and/or group study of special topics. To be identified by subtitle. Prerequisite: prior arrangement with faculty supervisor(s).	
COMM 595. Communication Internship for Graduate Students	3 cr.
Internship opportunity to apply what students have learned to the real world. Prerequisite: 9 credits of M.A. degree. Restricted to majors.	
COMM 599. Master's Thesis	0-88 cr.
Thesis.	

COMPUTER SCIENCE

Department website: <http://www.cs.nmsu.edu>
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E. Pontelli, department head, Ph.D. (New Mexico State University)- parallel processing, logic programming, knowledge representation, bioinformatics, assistive technologies; H. Cao, Ph.D. (Hong-Kong)- data mining, databases, data integration; J. Cook, Ph.D. (Colorado)-software engineering, component-based systems; H. Leung, Ph.D. (Penn State-University Park)-automata theory; S. Misra (Arizona State)- computer networks, social networks; I. Pivkina, Ph.D. (Kentucky)-artificial intelligence, knowledge representation, logic programming; M. Song, Ph.D. (Washington)- statistical computing, systems biology, computational neuroscience, computer vision; S. C. Tran, Ph.D. (Texas-El Paso)-artificial intelligence, knowledge representation, planning, logic programming, nonmonotonic reasoning; K. Villaverde, Ph.D. (New Mexico State)-interval computations, computer gaming

Support and Adjunct Faculty:

S. Cooper, Ph.D. (New Mexico State)-computer networks; J. Cowie, Ph.D. (Strathclyde)-natural language processing; R. T. Hartley, Ph.D. (Brunell)-programming systems, computer music; S. Helmreich, Ph.D. (Illinois)-natural language processing, machine translation; J.J. Pfeiffer, Jr., Ph.D. (Washington)- visual programming; E. Steiner, Ph.D. (Oklahoma State)-computer science education; C. Strauss, Ph.D. (Cornell)-computational biology; M. Wolinski, Ph.D. (MIT)-computational biology

DEGREE: Master of Science
MAJOR: Computer Science

DEGREE: Doctor of Philosophy
MAJOR: Computer Science

MINOR: Computer Science

MISSION OF THE DEPARTMENT

The mission of the Department of Computer Science at New Mexico State University is to provide formal education in the core disciplines of computer science as well as to prepare our graduates for research, development, and academic careers. The department offers specific expertise in specialized research areas, such as bioinformatics, artificial intelligence and knowledge representation, software engineering and programming languages, computer and wireless networks, parallel computing, interval computations, algorithms and theory of computing. A number of laboratories have been established to coordinate research activities, including the Knowledge representation, logic,

and advanced programming (KLAP) laboratory, the Programming languages, environments, and automated software engineering (PLEASE) laboratory, and the Game Design laboratory. The Department members are also directing the CREST Center for Research Excellence in Bioinformatics and Computational Biology, offering educational and research opportunities in bioinformatics.

ENTRANCE REQUIREMENTS FOR GRADUATE STUDY IN COMPUTER SCIENCE

The Graduate Record Exam (GRE) General Test is not required for admission; however, high GRE scores will strengthen a candidate's application and are highly regarded in the awarding of Graduate Assistantships. To be admitted without undergraduate deficiencies, an entering student must have completed undergraduate preparation substantially equivalent to that required for the Bachelor of Science degree in computer science at New Mexico State University. Deficiencies should be satisfied as early in the student graduate program as possible, through the regular undergraduate courses, the C S 460- 469 transition courses, or through tests administered by faculty members in the relevant areas. Students should consult with their Graduate Advisor to address issues related to deficiencies. Deficiencies are also assigned to applicants whose transcripts denote low grades in selected areas. Admission is often denied to candidates with little background in Computer Science.

DEGREE: Doctor of Philosophy
MAJOR: Computer Science

Doctoral students may specialize in any of the areas in which computer science faculty have active research interests. Through interdisciplinary arrangements with other doctoral departments at New Mexico State University, doctoral students may also specialize in such areas as computational biology, computer networks, and cognitive science.

Doctoral students are expected to join the program with a preparation equivalent to that required for the Master's degree in computer science at New Mexico State University. The requirements for the degree are as specified in the NMSU graduate catalog, with the following additional considerations:

- The qualifying examination is implemented as a written examination, which examines the depth of knowledge in five areas of computer science. The five areas are Formal Languages and Computability, Analysis of Algorithms, Programming Languages, one between Operating Systems and Computer Architecture, and a fifth area agreed between the student and the department's Graduate Committee.
- The comprehensive examination evaluates depth of knowledge in the specific research area selected by the candidate. The comprehensive exam includes both a written part, in the form of an extensive survey paper and an annotated bibliography, and an oral examination.
- The student is required to submit and defend a prospectus, at the same time or after completing the comprehensive examination. The prospectus describes and motivates the specific research problem to be addressed in the doctoral dissertation.

Students should contact the department for information on additional graduation requirements, or visit the on-line Graduate Handbook (<http://www.cs.nmsu.edu/>).

DEGREE: Master of Science
MAJOR: Computer Science

Each master's student normally must write a thesis (C S 599) or, with the advisor's permission, undertake a research project (C S 598). In either case, the number of required graduate credits is 33, including 6 for the thesis or project. In all cases, the students are required to sustain a final exam, covering the thesis/research project and the graduate course-work. The two parts of the exam bring equal weight.

In no case may a C S course numbered below 500 be counted towards the number of credits. In particular, graduate students are expected to register for CS classes numbered 500 or above. The student's program must include:

- C S 510
- C S 570
- One of: C S 573, C S 574, C S 584
- One of: C S 571, C S 575, C S 580, C S 581, C S 582
- One additional course selected between: C S 550, C S 571, C S 572, C S 573, C S 574, C S 575, C S 580, C S 581, C S 582, C S 584,
- One additional computer science course numbered above 550 and different from C S 598, C S 599, C S 600, and C S 700.

Courses not in Computer Science can be included in the student's program of study only if prior written approval has been obtained from the student's advisor and the departmental Graduate Committee. Further details can be found in the on-line Graduate Handbook (<http://www.cs.nmsu.edu/>).

With the advisor's written consent, the student may instead complete a coursework-only Master degree; this requires 36 credits of regular course work, satisfying the same requirements listed above, except that the 6 credits of thesis or project are replaced by 9 credits of courses numbered 550 or above and distinct from C S 589, C S 598, and C S 599. Students pursuing a coursework-only degree are expected to complete a written exam, covering a selected subset of the students' plan of study, and a comprehensive oral exam. Further details can be found in the on-line Graduate Handbook (<http://www.cs.nmsu.edu/>)

ASSISTANTSHIPS

Graduate assistantships—in the form of Teaching and Research assistantships—are expected to be available during the academic year. Inquiries should be addressed to the departmental Graduate Committee. Research assistantships are available at the discretion of individual research project leaders in the Department or elsewhere on campus. Submitting detailed vitae, letters of reference, and GRE test scores is encouraged when applying for any assistantship.

COMPUTER SCIENCE

- C S 450. C Programming 3 cr. (2+3P)
Programming in the C language. More advanced than C S 167. Recommended for nonmajors only. Prerequisite(s): Graduate standing.
- C S 451. C++ Programming 3 cr.
Programming in the C language. More advanced than C S 177. Recommended for nonmajors only. Prerequisite(s): Graduate standing.
- C S 452. Java Programming 3 cr. (2+2P)
Programming in the Java language. More advanced than C S 187. For nonmajors only. Prerequisite(s): Graduate standing.
- C S 457. Topics in Software Programming and Applications 3 cr. (2+2P)
Current topics in computer programming and software applications. Topic announced in the Schedule of Classes. More advanced than CS 157. Recommended for non-majors only. May be repeated if subtitle is different. Prerequisite(s): Graduate standing.
- C S 460. Computer Science I Transition 3 cr.
Computational problem solving; problem analysis; implementation of algorithms. Recursive structures and algorithms. For CS graduate students only; cannot be used in a student's program of study. Taught with C S 172. Consent of instructor required.
- C S 462. Object Oriented Programming Transition 3 cr.
Introduction to problem analysis and problem solving in the object-oriented paradigm. Practical introduction to implementing solutions in the C++ language. Hands-on experience with useful development tools. For C S graduate students only; cannot be used in a student's program of study. Consent of instructor required. Prerequisite(s): At least a C in CS 172 or CS 460 or consent of instructor.
- C S 463. Introduction to Data Structures Transition 3 cr.
Design, implementation, use of fundamental abstract data types and their algorithms: lists, stacks, queues, deques, trees; imperative and declarative programming. Internal sorting; time and space efficiency of algorithms. For C S graduate students only; cannot be used in a student's program of study. Consent of instructor required. Prerequisite(s): At least a C in CS 172 or CS 460 or consent of instructor.
- C S 464. Machine Programming and Organization Transition 3 cr.
Computer structure, instruction execution, addressing techniques; programming in machine and assembly languages. For C S graduate students only; cannot be used in a student's program of study. Consent of instructor required. Prerequisite(s): At least a C in C S 172 or C S 460 or consent of instructor.
- C S 465. Discrete Math for Computer Science Transition 3 cr.
Logical connectives, sets, functions, relations, graphics, trees, proofs, induction, and application to computer science. For C S graduate students only; cannot be used in a student's program of study. Consent of instructor required. Prerequisite(s): At least a C in C S 172 or C S 460 or consent of instructor.
- C S 466. Compilers and Automata Transition 3 cr.
Methods, principles, and tools for programming language processor design; basics of formal language theory (finite automata, regular expressions, context-free grammars); development of compiler components. For C S graduate students only; cannot be used in a student's program of study. Consent of instructor required. Prerequisite(s): At least a C in C S 271 or C S 462, in C S 272 or C S 463, in C S 273 or C S 464, in C S 278 or C S 465, or consent of instructor.
- C S 468. Software Development Transition 3 cr.
Software specification, design, testing, maintenance, documentation; informal proof methods; team implementation of a large project. For C S graduate students only; cannot be used in a student's program of study. Consent of instructor required. Prerequisite(s): At least a C in C S 271 or C S 462, in C S 272 or C S 463, or consent of instructor.
- C S 469. Data Structure and Algorithms Transition 3 cr.
Introduction to efficient data structure and algorithm design. Order notation and asymptotic run-time of algorithms. Recurrence relations and solutions. Abstract data type dynamic set and red-black trees. Classic algorithm design paradigms: divide-and-conquer, dynamic programming, greedy algorithms. For C S graduate students only; cannot be used in a student's program of study. Consent of instructor required. Prerequisite(s): At least a C in C S 272 or C S 463, in C S 278 or C S 465, or consent of instructor.
- C S 470. Functional Programming 3 cr.
Applicative programming techniques: higher order functions, infinite data structures, lambda calculus, universal functions. Survey of functional languages including Miranda and ML. Not for C S graduate students. Prerequisite(s): At least a C in C S 272 and C S 278.
- C S 471. Programming Language Structure I 3 cr.
Syntax, semantics, implementation, and application of programming languages; abstract data types; concurrency. Not for C S graduates. Prerequisites: C or better in C S 370 and C S 371.
- C S 472. Logic and Constraint Logic Programming 3 cr.
Declarative programming techniques; foundations of logic programming; programming in Prolog; constraint logic programming; applications of logic and constraint programming. Not for C S graduate students. Prerequisite(s): At least C in C S 272 and C S 278.
- C S 473. Architectural Concepts I 3 cr.
Comparison of architectures to illustrate concepts of computer organization; relationships between architectural and software features. Not for C S graduate students. Prerequisites: at least a C in C S 273 and C S 370.
- C S 474. Operating Systems I 3 cr.
Operating system principles and structures, and interactions with architectures. Not for C S graduate students. Prerequisites: at least a C in C S 273, C S 371, and C S 372.
- C S 475. Artificial Intelligence I 3 cr.
Fundamental principles and techniques in artificial intelligence systems. Knowledge representation formalisms; heuristic problem solving techniques; automated logical deduction; robot planning methods; algorithmic techniques for natural language understanding, vision, and learning. Not for C S graduate students. Prerequisites: At least a C in MATH 330 and C S 372.
- C S 476. Computer Graphics I 3 cr.
Languages, programming, devices, and data structures for representation and interactive display of complex objects. Not for C S graduate students. Prerequisites: at least C in C S 272 or C S 273, MATH 280, MATH 291G.
- C S 478. Computer Security 3 cr.
Introduction to the art and science of computer security. Fundamentals of computer security including elementary cryptography, authentication and access control, security threats, attacks, detection and prevention in application software, operating systems, networks and databases. Prerequisite(s): At least a C in CS 273 or consent of instructor.
- C S 479. Special Topics 1-3 cr.
Topic announced in the Schedule of Classes. May be repeated if subtitle is different. Not for C S graduate students. Prerequisite: written agreement with instructor.
- C S 480. Linux System Administration 3 cr.
Basic system administration for Linux environments. Topics include user managements, file systems, security, backups, system monitoring, kernel configuration and other relevant aspects of system administration. Not for Computer Science graduate students.
- C S 481. Visual Programming 3 cr.
Design and implementation of languages using visual but nontextual means to specify programs. Not for C S graduate students.
- C S 482. Database Management Systems I 3 cr.
Database design and implementation; models of database management systems; privacy, security, protection, recovery. Not for C S graduate students. Prerequisites: at least a C in C S 272 and either C S 278 or MATH 279 or MATH 330.
- C S 483. Introduction to Robotics 3 cr.
Basic AI-based robotic architecture and concepts, with an emphasis on building and programming mobile robots. Not for C S graduate students.

- C S 484. Computer Networks I** 3 cr.
Fundamental concepts of computer communication networks: layered network architecture, network components, protocol stack and service. Example of application, transport, network and data link layers, protocols primarily drawn from the Internet (TCP, UDP, and IP) protocol multimedia networks; network management and security. Not for C S graduate students. Prerequisites: At least a C in C S 272 and CS 273, senior or graduate standing or consent of instructor. STAT 371 or STAT 470 recommended.
- C S 485. User Interface Design** 3 cr.
Interface design, conceptual models formed by users, computer aided instruction, natural and query languages, graphical representations. Not for C S graduate students. Prerequisite: at least C in C S 371.
- C S 486. Bioinformatics** 3 cr.
Introduction to bioinformatics and computational biology. Computational approaches to sequences analysis, protein structure prediction and analysis, and selected topics from current advances in bioinformatics. Not for C S graduate students.
- C S 491. Parallel Programming** 3 cr.
Programming of shared memory and distributed memory machines; tools and languages for parallel programming; techniques for parallel programming; parallel programming environments. Not for C S graduate students. Prerequisite: C or better in C S 370 or consent of instructor.
- C S 492. Computer Systems Modeling and Simulation** 3 cr.
Basic concepts of modeling computer systems: continuous and discrete time models, states and transition, probabilistic models. Structure of simulation programs, time driven and event driven simulation on captured and synthetic traces, generation of random variables, queuing models, Markov chains, random walks, Poisson, Markov, renewal branching and Brownian motion processes, model validation and data analysis. For C S undergraduate students and non-C S graduate students only.
- C S 501. Functional Programming** 3 cr.
Applicative programming techniques: higher order functions, infinite data structures, lambda calculus, and universal functions. Survey of functional languages including Miranda and ML; requires more advanced graduate work than C S 470.
- C S 502. Database Management Systems I** 3 cr.
Database design and implementation; models of database management systems; privacy, security, protection, recovery; requires more advanced graduate work than C S 482. Prerequisite: At least a C in C S 272 and either C S 278, MATH 279, or MATH 330.
- C S 503. Introduction to Robotics** 3 cr.
Basic AI-based robotic architectures and concepts, with an emphasis on building and programming mobile robots; requires more advanced graduate work than C S 483.
- C S 504. Computer Networks II** 3 cr.
Fundamental concepts of computer communication networks: layered network architecture, network components, protocol stack and service. Example of application, transport, network and data link layers, protocols primarily drawn from the Internet (TCP, UDP, and IP) protocol suite; local and wide area networks, wireless and mobile networks, multimedia networks; network management and security; requires more advanced graduate work than C S 484.
- C S 505. Artificial Intelligence I** 3 cr.
Fundamental principles and techniques in artificial intelligence systems. Knowledge representation formalisms; heuristic problem solving techniques; automated logical deduction; robot planning methods; algorithmic techniques for natural language understanding, vision and learning; requires more advanced graduate work than CS 475.
- C S 506. Computer Graphics I** 3 cr.
Languages, programming, devices, and data structures for representation and interactive display of complex objects.
- C S 507. Visual Programming** 3 cr.
Design and implementation of languages using visual but non-textual means to specify programs; requires more advanced graduate work than C S 481.
- C S 510. Automata, Languages, Computability** 3 cr.
Regular and context-free languages, pushdown and finite-slate automata, turing machines, models of computation, halting problems. Prerequisite: at least C in C S 370 and C S 372.
- C S 511. Logic and Constraint Logic Programming** 3 cr.
Declarative programming techniques; foundations of logic programming; programming in Prolog; constraint logic programming; application of logic and constraint programming; requires more advanced graduate work than C S 472. Prerequisite(s): At least a C in C S 272 and C S 278, or consent of instructor.
- C S 512. Computer Systems Modeling and Simulation** 3 cr.
Basic concepts of modeling computer systems: continuous and discrete time models, states and transition, probabilistic models. Structures of simulation programs, time driven and event driven simulation, simulation on captured and synthetic traces, generation of random variables, queuing models, Markov chains, random walks, Poisson, Markov, renewal branching and Brownian motion processes, model validation and data analysis; requires more advanced graduate work than C S 492.
- C S 515. User Interface Design** 3 cr.
Interface design, conceptual models formed by users, computer-aided instruction, natural and query languages, graphical representations; requires more advanced graduate work than C S 485.
- C S 516. Bioinformatics** 3 cr.
Introduction to bioinformatics and computational biology. Computational approaches to sequences analysis, protein structure prediction and analysis, and selected topics from current advances in bioinformatics; requires more advanced graduate work than C S 486.
- C S 521. Parallel Programming** 3 cr.
Programming of shared memory and distributed memory machines; tools and languages for parallel programming; parallelizing compilers; parallel programming environments; requires more advanced graduate work than C S 491.
- C S 550. Complexity Theory** 3 cr.
Polynomially bounded, NP-complete, exponentially hard, and undecidable problems; reducibility. Prerequisite: C S 510.
- C S 552. Introduction to Computational Science and Engineering** 3 cr.
Modeling of scientific and engineering problems; computational methods for solving such problems including data structure design and relevant discrete and numerical algorithms. Prerequisite: consent of instructor.
- C S 560. Graph Theory** 3 cr.
Graph theoretic models in all areas of computer science including computer architectures, computation geometry, fault tolerance, databases. Includes connectivity, colorability, factorization, topological embeddings in surfaces, reconstruction, groups and matrices associated with graphs. Prerequisite: consent of instructor.
- C S 562. Advanced Computational Science and Engineering** 3 cr.
Introduction to high-performance computing, parallel programming, computational methods using high-performance computers. In-depth study of applications from science and engineering including mathematical modeling, sequential and parallel algorithm design, implementation, and performance tuning. Prerequisite C S 552.
- C S 570. Analysis of Algorithms** 3 cr.
Techniques for design and analysis of algorithms; time and space complexity; proving correctness of programs. Particular algorithms such as sorting, searching, dynamic programming. NP complete problems. Prerequisite: at least C in C S 372.
- C S 571. Programming Language Structure II** 3 cr.
Formal semantics of programming languages. Prerequisites: C S 372, C S 471.
- C S 572. Advanced Algorithms** 3 cr.
Design, analysis, and use of important algorithms and data structures. Prerequisite: C S 570 or consent of instructor.
- C S 573. Architectural Concepts II** 3 cr.
Advanced topics related to computer architecture, guided by the current literature. Prerequisites: C S 473, C S 474.
- C S 574. Operating Systems II** 3 cr.
Advanced topics related to operating system principles, guided by the current literature. Prerequisites: C S 473, C S 474.
- C S 575. Artificial Intelligence II** 3 cr.
Covers advanced theory and application of artificial intelligence. Concentration on several specific research areas, such as knowledge representation, problem solving, common-sense reasoning, natural language understanding, automated tutoring systems, learning systems. Prerequisites: C S 475 or CS 505 or consent of instructor.
- C S 579. Special Topics** 1-6 cr.
Topic announced in the Schedule of Classes. Prerequisite: written agreement with instructor. May be repeated if subtitle is different. Prerequisite: consent of instructor.
- C S 580. Compiler Construction** 3 cr.
Current methods in the design and implementation of compilers; construction of components of an actual compiler as a term project. Prerequisites: C S 471, C S 510.
- C S 581. Advanced Software Engineering** 3 cr.
Advanced tools and methods for developing large software systems. Topics include object-oriented modeling and design, component architectures,

templates and generic programming, software configuration and revision control, static and dynamic analysis tools, model, checking, advanced testing, and verification. Prerequisite: C S 371.

- C S 582. Database Management Systems II 3 cr.
Advanced data models and abstractions, dependencies, implementations, languages, database machines, and other advanced topics. Prerequisite: C S 482 or 502 or consent of instructor.
- C S 584. Computer Networks II 3 cr.
Advanced topics in computer networks. Covers advanced topics in networking, with emphasis on wireless, and IP networks. Prerequisite(s): C S 484 or C S 504, STAT 371 or STAT 470 or by consent of instructor.
- C S 589. Special Research Problems 1-6 cr.
Faculty-supervised investigation, to culminate in a written report. Prerequisite: written agreement with faculty supervisor. May be repeated; maximum of 6 credits may be applied toward M.S. degree. Restricted to majors.
- C S 598. Master's Project 1-6 cr.
Project-oriented capstone course to be completed by M.S. students under supervision of their advisor. Maximum of 6 credits may be applied toward M.S. degree. Prerequisite: written agreement with instructor. Restricted to C S majors.
- C S 599. Master's Thesis 1-6 cr.
Thesis to be developed by M.S. Students under supervision of their advisor. Prerequisite: consent of instructor. May be repeated for a maximum of 6 credits. Restricted to majors.
- C S 600. Pre-dissertation Research 1-88 cr.
Pre-dissertation research.
- C S 629. Selected Topics in Computer Science 1-3 cr.
Topics of current interest designated by subtitle. May be repeated.
- C S 700. Doctoral Dissertation 0-88 cr.
Dissertation.

CRIMINAL JUSTICE

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J. Maupin, department head, Ph.D. (Arizona State)—policy analysis and program evaluation, criminal justice systems; C. Bejarano, Ph.D. (Arizona State)—border violence and justice and border identities, justice, race, class, and gender in the CJ system; J. E. Crowley, Ph.D. (Michigan)—community corrections, victims and gender in criminal justice; R. J. Durán, Ph.D., (Colorado-Boulder)—Mexican-American gangs, race, crime and justice; D. Greene, Ph.D., (John Jay)—corrections, restorative justice, sentencing and punishment policy; D. Keys, Ph.D., (Missouri-Columbia)—penology, narcotic policy; D. Lara, Ph.D. (University of California-Berkeley)—cultural studies, race & ethnicity, border justice; R. Maratea, Ph.D. (Delaware)—Media and Crime, Theory, Inequality and Crime; C. E. Posadas, Ph.D. (Arizona State)—immigration and justice, research methods; L. T. Winfree, Ph.D. (Montana)—theory and theory construction, corrections, juvenile justice.

DEGREE: Master of Criminal Justice

The Department of Criminal Justice offers graduate study leading to the Master of Criminal Justice (M.C.J.) degree. Admission to the M.C.J. is competitive and prospective graduate students are expected to have at least a 3.0 undergraduate grade-point-average, coursework in research methods and statistics, and possess a bachelor's degree. Those not meeting these requirements may be admitted conditionally and required to make up deficiencies at the outset of their program of study. Applicants must submit three letters of recommendation and a three – five page essay introducing themselves and addressing the following topic: "the most important change needed in the criminal justice system is..." This essay serves as a sample of written work to be evaluated by the M.C.J. Graduate Committee. The GRE is NOT required for admission into the M.C.J. program. The M.C.J. Graduate Committee reserves the right to require a student to complete additional English writing coursework.

After completion of all core course requirements, candidates declare their intent to pursue a degree option and complete all chosen degree option requirements. There are two M.C.J. degree options: the thesis and focused coursework. The degree options are provided so that students may better match their education with career goals. The thesis option is often used by students interested in

pursuing careers in basic and applied criminal justice research or a doctoral degree. The focused coursework option is often used by students pursuing administrative positions within criminal justice agencies. The Thesis Option is only available for Campus-Based students. Online students may only pursue the Focused Coursework Option.

All candidates, regardless of chosen degree option, must complete a final examination. Examination requirements vary by degree option. Please contact the director of the M.C.J. program or consult the Department of Criminal Justice web site <http://crimjust.nmsu.edu/degrees.htm> for details.

Thesis Option (33 cr.)

Thesis students must submit a thesis proposal to their faculty committee for approval and subsequently complete the approved thesis project. An approved thesis proposal is one wherein the thesis committee determines the student demonstrates a comprehensive understanding of the nexus of theory, method, and policy as it applies to the proposed thesis project. At the discretion of the thesis committee the proposal may be considered inadequate and the student is required to revise and resubmit the thesis proposal until the committee determines the proposal is satisfactory. The final examination minimally includes a defense of the completed thesis, but may also include a general examination based upon the candidate's program of study. The minimum coursework requirements are displayed below.

Required Courses (21 cr.)

C J 501, Research Methods in Criminal Justice or,	
C J 503, Seminar in Criminal Justice Research Methods or,	
C J 555, Advanced Feminist Research Methods	3
C J 510, Advanced Criminal Justice Administrative Systems or,	
C J 541, Seminar in Criminal Justice Policy Analysis and Planning or,	
C J 542, Seminar in Applied Criminal Justice Analysis	3
C J 511, Nature of Crime	3
C J 514, Advanced Race, Crime, and Justice or,	
C J 521, Law and Social Control	3
C J 525, Issues in Ethics, Law, and Criminal Justice	3
C J 599, Master's Thesis	6

General Electives (12 cr.)

Students may not count Internship (CJ 593) or Independent Research (CJ 592) credit toward their elective requirement. No more than three total credits of Directed Readings (CJ 591) coursework may be used as electives; a minimum of 3 of the 9 credit general elective requirement must come from the Department of Criminal Justice. A minor is optional (contact the director of the M.C.J. program or consult the Department of Criminal Justice web site, <http://crimjust.nmsu.edu/degrees.htm>, for details) and may result in more than 33 total credits for the degree.

Focused Coursework Option (36 cr.)

Focused coursework students must pass a written comprehensive examination following completion of the required courses. Students not passing the examination will be required to wait until the following semester to retake the examination. The minimum course requirements are displayed below.

Required Courses (15 cr.)

C J 501, Research Methods in Criminal Justice or,	
C J 503, Seminar in Criminal Justice Research Methods or,	
C J 555, Advanced Feminist Research Methods	3
C J 510, Advanced Criminal Justice Administrative Systems or,	
C J 541, Seminar in Criminal Justice Policy Analysis and Planning or,	
C J 542, Seminar in Applied Criminal Justice Analysis	3
C J 511, Nature of Crime	3
C J 514, Advanced Race, Crime, and Justice or,	
C J 521, Law & Social Control	3
C J 525, Issues in Ethics, Law, and Criminal Justice	3

C J Electives (12 cr.)

Electives are to be chosen in consultation with a student's advisor. No more than three total credits of Internship or Directed Readings courses may be used as Criminal Justice electives. Independent Research may not be used as Criminal Justice Electives for this option.

General Electives/Minor (9 cr.)

Electives are to be chosen in consultation with a student's advisor. No more than three credits of Internship or Directed Readings may be used to fulfill the general elective requirement. Independent Research may not be used as Criminal Justice Electives for this option. A minor is optional (contact the director of the M.C.J. program or consult the Department of Criminal Justice web site, <http://crimjust-nmsu.edu/degrees.htm>, for details) and may result in more than 36 total credits for the degree.

Online M.C.J. Coursework

Distance-based graduate students taking courses online may also complete the M.C.J. degree. Online criminal justice courses are available only to those admitted to the M.C.J. program as online students, or with permission of the Director of the M.C.J. program. Students desiring to be admitted to the M.C.J. program as online students must declare that intent in writing to the M.C.J. director. Online students may not enroll in campus-based criminal justice courses. Online students may only pursue the Focused Coursework Option. For more information regarding the online M.C.J. degree option, consult the Department of Criminal Justice web page, <http://crimjust.nmsu.edu>, or contact the Director of the M.C.J. program.

CRIMINAL JUSTICE

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|--|-------|---|-------|
| C J 450. Crime, Justice and Society | 3 cr. | C J 511. Nature of Crime | 3 cr. |
| Critical analysis of dynamic relationship between the U.S. eco-politico-socio structure, its criminal justice system, and consequent policies and practices. Prerequisite(s): 60 credit hours. | | Defining and measuring crime, crime causation, and criminal behavior systems. Prerequisite: C J major or consent of instructor. Restricted to majors. | |
| C J 451. Border Violence and Justice | 3 cr. | C J 512. Seminar in Theories and Theory Construction | 3 cr. |
| Critical analysis of violence and systems of justice along border regions. Examines causes and correlates of violence experienced by those living in border regions and the social responses to that violence. | | Major theories of crime, alternative approaches to an integration of the various perspectives, and the development of causal models. Topics announced in the Schedule of Classes. May be repeated under different subtitles for a maximum of 6 credits. | |
| C J 452. Upper World Crime | 3 cr. | C J 514. Advanced Race, Crime, and Justice | 3 cr. |
| Corporate crime, white collar crime and political abuse and corruption; executive and corporate criminal behavior, and violations of the public trust by elected and appointed officials. Prerequisite: restricted to majors or consent of instructor. | | Advanced analysis of the historical and contemporary relationship between race and crime in the United States with emphasis upon human equality and fairness. Overview of racial and ethnic social categorizations and how they impact law and order. | |
| C J 453. Women and Justice | 3 cr. | C J 515. A Course on Punishment | 3 cr. |
| Critical analysis of the impact of the criminal justice system, race and class upon the lives of women. Restricted to majors. | | Exploration and analysis of the idea and practice of punishment through a variety of philosophical perspectives, seeking to understand its moral and practical viability as employed in contemporary society, including its application within the criminal justice system. | |
| C J 454. Human Trafficking | 3 cr. | C J 521. Law and Social Control | 3 cr. |
| Study of global human trafficking, its causes and costs, and mitigation strategies. Restricted to CJ, GOVT, SOC, W S, S WK majors. | | The development and implementation of criminal law. Consideration of functionalist, conflict, and interpretive theories and research. Prerequisite: C J major or consent of instructor. Restricted to majors. | |
| C J 455. Feminist Research Methods | 3 cr. | C J 522. Legal Issues in Criminal Justice | 3 cr. |
| Feminist research practices and methodologies utilized in various disciplines. Definitions of research, what constitutes valid inquiry, how research can be feminist, and what it means to do interdisciplinary work. Same as W S 455. | | Major legal concerns in the formulation and implementation of criminal law. | |
| C J 480. Criminal Justice Planning and Crime Analysis | 3 cr. | C J 523. Seminar in Criminal Law | 3 cr. |
| Basic working tools in gathering data for the purpose of developing criminal justice plans and programs. Planning criteria, program implementation strategies, and evaluation requirements. Prerequisite: restricted to majors or consent of instructor. | | Major theoretical orientations, specific areas of research, and contemporary policy issues. Content will vary and will be listed in the Schedule of Classes. May be repeated under different subtitles for unlimited credit. | |
| C J 481. Hate Crimes and Domestic Terrorism | 3 cr. | C J 524. Forensic Law | 3 cr. |
| Overview of religious and political extremism in the U.S., with a particular focus on the roots and practices of extremist groups and their doctrines. Prerequisite: CJ 380 or consent of instructor. | | Rules and policy implications related to the use of scientific information in legal process. Prerequisite: C J major or consent of instructor. Restricted to majors. | |
| C J 482. Transnational Terrorism | 3 cr. | C J 525. Issues in Ethics, Law, and Criminal Justice | 3 cr. |
| Overview of international terrorism and its sociological, political, historical, and religious causes, with a particular focus on current terrorism. | | Examination of the key ethical and decision-making dilemmas facing professionals working in the fields of law and criminal justice. Restricted to majors. | |
| C J 501. Research Methods in Criminal Justice | 3 cr. | C J 526. Advanced Race & Environmental Justice | 3 cr. |
| Research design, methods of data collection and analysis, and preparation of research reports. Prerequisite: C J major or consent of instructor. Restricted to majors. | | Advanced analysis of concepts of justice and social justice responses across the 20th and 21st centuries to environmental degradation affecting communities of differing racial and ethnic backgrounds. | |
| C J 502. Criminal Justice Statistics | 3 cr. | C J 527. Advanced Race & Crime in Film | 3 cr. |
| Intermediate level statistical techniques applied to criminal justice data. Prerequisite: C J major or consent of instructor. Restricted to majors. | | Advanced critical analysis of film where messages relating race and crime are present, with emphasis on how this imagery informs problem definition, policies, and practice within the criminal justice system. | |
| C J 503. Seminar in Criminal Justice Research Methods | 3 cr. | C J 532. Advanced Issues in Criminal Justice (f, s, sum) | 3 cr. |
| Seminar in specific research methods as applied to criminal justice topics, as announced in the Schedule of Classes. Prerequisite: C J 501. May be repeated under different subtitles for a maximum of 6 credits. | | Seminar on problems and conflicts encountered in major criminal justice issues. Topics announced in the Schedule of Classes. May be repeated under different subtitles for unlimited credit. | |
| C J 510. Advanced Criminal Justice Administrative Systems | 3 cr. | C J 533. Seminar in Criminal Justice Administration | 3 cr. |
| Structure and operations of criminal justice agencies and institutions; relationships of structure and operations to practical police, courts, and corrections problems. | | Organizational and administrative issues currently confronting criminal justice agencies. Different subtitles (police, courts, and corrections) to be announced in the Schedule of Classes. May be repeated under different subtitles for unlimited credit. | |
| | | C J 535. Advanced Political Penology | 3 cr. |
| | | Advanced comparative analysis of incarceration and sanctions as punishment for crimes of conscience, religious intolerance, and dissidence. | |
| | | C J 540. World Criminal Justice Systems | 3 cr. |
| | | Explores cross and trans-national nature of crime in the 21st century. Emphasize various philosophies, legal systems and justice responses to crime and criminals yielding a global view of criminal justice theories and practices. Restricted to majors. | |
| | | C J 541. Seminar in Criminal Justice Policy Analysis and Planning | 3 cr. |
| | | Seminar on policy development, planning and implementation processes in criminal justice. Links formal policy goals as they relate to theory and outcomes. Topics announced in the Schedule of Classes. Prerequisite: C J major or consent of instructor. Restricted to majors. | |
| | | C J 542. Seminar in Applied Criminal Justice Analysis | 3 cr. |
| | | Identification of issues and techniques for assessing the effectiveness of specific programs in relation to the operation of criminal justice agencies or clients. Prerequisites: C J 501 or C J 502, and either C J major or consent of instructor. Restricted to majors. | |
| | | C J 545. Advanced Victimology | 3 cr. |
| | | Study of risk factors in crime victimization, the impact of crimes upon victims, and the role of the victim in the criminal justice system. Consideration of the impact of criminal justice policy on victim outcomes. Same as W S | |

545.	
C J 546. Psychology and the Justice System	3 cr.
Advanced analysis of psychological underpinnings of criminal behavior and the implications of these psychological principles for criminal justice policy. Restricted to majors.	
C J 547. Advanced Sex Crimes	3 cr.
Advanced study of dynamics of sex crimes for victims and offenders plus consideration of the legal and correction systems' response to sex crimes. Restricted to CJ, GOVT, SOC, W S, S WK majors.	
C J 554. Advanced Human Trafficking	3 cr.
Advanced study of global human trafficking, its causes and costs, and mitigation strategies. Restricted to C J, GOVT, SOC, W S, S WK majors.	
C J 555. Advanced Feminist Research Methods	3 cr.
Advanced feminist research practices and methodologies utilized in various disciplines. Definitions of research, what constitutes valid inquiry, how research can be feminist, and what it means to do interdisciplinary work. Same as W S 555.	
C J 560. Juvenile Justice Systems	3 cr.
Policy development and operations in police, court, and correctional agencies in response to juveniles. Analysis of programs designed to identify, prevent and treat juvenile offenders. CJ 570. Probation and Parole 3 cr. Advanced analysis of goals, theories and practices of all forms of correction in the community, including probation, parole, plus other intermediate sanctions. Restricted to majors.	
C J 570. Probation and Parole	3 cr.
Advanced analysis of goals, theories, and practices of all forms of correction in the community, including probation, parole, plus other intermediate sanctions. Restricted to majors.	
C J 580. Advanced Issues in Terrorism	3 cr.
Advanced analysis of legal, cultural and policy issues in contemporary terrorism.	
C J 581. Community Policing	3 cr.
Overview and analysis of community policing issues from various perspectives. Analysis of strategies that facilitate police and community collaboration. Restricted to majors.	
C J 582. Advanced International Terrorism	3 cr.
Advanced analysis of Islamic terrorism worldwide, tracing its development as a form asymmetric warfare from the seventh century through the present, and U.S. and International governmental responses.	
C J 586. Hate Crimes, Domestic Terrorism and Policy Analysis	3 cr.
Advanced analysis of religious and political extremism in the U.S. from the Civil War through the present. Comparison of hate crimes with terrorists acts, and U.S. federal policies concerning these activities.	
C J 591. Directed Readings in Criminal Justice	3 cr.
Supervised review of literature in specialized areas of the nature of crime, law and social control, and criminal justice administration. Consent of instructor required.	
C J 592. Independent Research	1-3 cr.
Design and execution of a criminal justice research project. Requires a written paper in standard format, including literature review, hypotheses, methodology, findings, and conclusions.	
C J 593. Internship	3-6 cr.
Supervised placement in an applied or research setting in criminal justice. An in-depth written report of the project is required. Prerequisites: introductory graduate course in the area of the internship and consent of the internship supervisor. Restricted to C J majors. May be repeated for a maximum of 6 credits. Graded S/U.	
C J 599. Master's Thesis	0-88 cr.
Thesis.	

ENGLISH

Department Website: <http://www.nmsu.edu/~english>
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M. Torres, Ph.D. (New Mexico)-cultural studies, film; J. Almjeld, Ph.D. (Bowling Green)-digital communication, new media, literacies; R. Bradburd, M.F.A. (New Mexico State)-creative writing: fiction, creative nonfiction; C. Burnham, Ph.D. (Rhode Island)-rhetoric and composition, American literature; R. Cull, Ph.D. (Illinois)-modern and contemporary American literature; J. Garay, Ph.D. (Arizona State)-Chicano/a and Latino/a literature; R. Greenfield, Ph.D. (Denver)- creative writing, poetry; S. Hagelin, Ph.D. (Virginia)-20th-century American cultural stud-

ies and film; L. Hoang, M.F.A (Notre Dame)- creative writing: fiction; H. Linkin, Ph.D. (Michigan)-British Romantic literature, gender and language theory; T. Miller-Tomlinson, Ph.D. (Yale)-Shakespeare, early modern literature; R. Romm, MFA (San Francisco State)- creative writing, fiction; B. Rourke, Ph.D. (Stanford) modern British literature, critical theory; E. Schirmer, Ph.D. (California-Berkeley)- medieval literature; J. Sheppard, Ph.D. (Michigan Tech)-multimedia development, technical and professional communication, workplace studies; C. Smith, M.F.A. (Iowa)-creative writing: poetry; T. Stolte, Ph.D. (British Columbia)- 19th-century British literature and culture; B. Thatcher, Ph.D. (Purdue)-professional communication, intercultural rhetoric; K. Valentine, Ph.D. (Michigan Tech)- rhetoric and composition, literacy studies, writing center theory and practice; C. Voisine, Ph.D. (Utah)-creative writing: poetry, creative nonfiction; P. Wojahn, Ph.D. (Carnegie Mellon)-professional communication, computers and writing.

DEGREE: Master of Arts
MAJOR: English

DEGREE: Master of Fine Arts in Creative Writing

DEGREE: Doctor of Philosophy
MAJOR: Rhetoric and Professional Communication

DEGREE: Master of Arts
MAJOR: English

New Mexico State University offers M.A. programs in four areas of emphasis; each one requires 36 hours of graduate-level work.

Creative Writing: Students electing this emphasis choose a major genre: poetry or fiction. Students complete 36 hours of graduate-level course work including creative writing and literature; demonstrate a knowledge of a second language; submit a creative writing portfolio; and pass an oral examination.

English Studies for Teachers: Students take core courses in creative writing, film, literature, and rhetoric and professional communication. Students take additional courses in an area of emphasis determined in consultation with an advisor. They conclude their program by developing a master's portfolio and taking an oral examination.

Literature: Students can choose to work in various areas of literature, criticism, and film. Students are required to fulfill area requirements (in early and modern literatures, in British and American literatures, and in critical theory); demonstrate competency in a foreign language; write a master essay or thesis; and complete their program with an oral examination.

Rhetoric and Professional Communication: Students take core courses across a wide range of topics within rhetoric and professional communication and choose from one of four areas of emphasis: Composition, Critical/Cultural Studies, Rhetoric, and Professional and Technical Communication. Students conclude their program by writing a thesis, presenting a portfolio of work completed in the program, or writing a master essay, and taking an oral examination.

DEGREE: Master of Fine Arts in Creative Writing

New Mexico State University offers a program of study leading to the M.F.A. in Creative Writing requiring 54 hours of graduate-level work. Students devote themselves to concentrated study and development of a chosen genre: poetry or fiction. Secondary course requirements include studies in literature. Competency in a foreign language is required. Creative writing workshops are emphasized, and presentation of a thesis of original work, along with a public reading and an oral examination, culminates in the degree. Submission of a portfolio of creative work is an important admission requirement.

DEGREE: Doctor of Philosophy
MAJOR: Rhetoric and Professional Communication

Students are required to take 78 hours of graduate-level coursework including the proseminar; research methods; core courses in composition, critical/cultural studies, professional communication, and rhetoric; additional coursework in an area of emphasis determined in consultation with an advisor; an internship; and a dissertation. The Ph.D. also requires a qualifying examination, a comprehensive examination and an oral examination.

FINANCIAL SUPPORT

Students are eligible for teaching assistantships and a variety of positions that involve writing around campus and the community. Because many students work full time, many courses are offered in the late afternoon and evening to accommodate various schedules.

APPLICATION INFORMATION

Applicants for admission to graduate study in English should complete all application procedures required by the Graduate School. This includes (1) submitting an Application for Admission to the Graduate School, and (2) having official transcripts from all institutions the applicant has attended sent to the Graduate School. In addition, applicants must submit other materials directly to the English Department.

Each applicant to the M.A. (emphasis in Creative Writing) must submit (1) an application to the English Department, (2) a statement of purpose outlining the applicant's objectives for graduate study, (3) a portfolio of the applicant's creative work including 6-8 poems or 15-25 pages of fiction, and (4) three letters of reference, to be sent directly to the Department of English by the applicant's referees.

Each applicant for the M.A. in English (emphasis in Literature) must submit (1) an application to the English Department, (2) a statement of purpose outlining the applicant's objectives for graduate study, (3) samples of the applicant's academic writing, and (4) three letters of reference, to be sent directly to the Department of English by the applicant's referees.

Each applicant for the M.A. in English (emphasis on English Studies for Teachers and emphasis in Rhetoric and Professional Communication) must submit (1) an application to the English Department, (2) a statement of purpose outlining the applicant's objectives for graduate study, (3) samples of the applicant's academic writing, (4) a curriculum vitae, (5) a statement of teaching interest (if applying for an assistantship) and (6) three letters of reference, to be sent directly to the Department of English by the applicant's referees.

Each applicant to the M.F.A. in Creative Writing must submit (1) an application to the English Department, (2) a statement of purpose outlining the applicant's objectives for graduate study, (3) a portfolio of the applicant's creative work including 10 poems or 20-25 pages of fiction, and (4) three letters of reference, to be sent directly to the Department of English by the applicant's referees.

Each applicant for the Ph.D. program must submit (1) an application to the English Department, (2) a statement of purpose addressing personal, academic, and professional interests and experience, (3) writing samples that reflect strong research potential and/or work done as a professional communicator, (4) a curriculum vitae, (5) a statement of teaching interests and qualifications, and (6) three letters of reference, to be submitted directly to the Department of English by the applicant's referees.

The Graduate School and the Department of English do not require students to submit scores on psychometric examinations (e.g., the Graduate Record Examination.)

ENGLISH

- ENGL 451. Practicum in the Grammar of American English 3 cr.
Studies of formal grammar of the English language in preparation for the teaching of the English language and/or advanced linguistic analysis.
- ENGL 452. History of the English Language 3 cr.
This course examines the history of the English language from its Indo-European origins through its development into an international language. The aim is to describe the English language formally and to trace linguistic change over time. Samples of written English will illustrate various stages in the development of English. Also considered are contemporary social and political issues related to language, including the problem of 'standard English' and the uses of language in advertising, the media, and politics.
- ENGL 453. World Literatures 3 cr.
Study of one or more literary traditions exclusive of those originating in Europe and the United States. Readings will include texts in translation. Repeatable once under a different subtitle.
- ENGL 454. Postcolonial Literature 3 cr.
Study of the transformations of literature and theory produced in the context of decolonization and its aftermath, from the twentieth century to the present. Some texts will be read in translation. Repeatable once under a different subtitle.
- ENGL 456. Ethnic Studies in US Literature and Culture 3 cr.
Concentrates on comparative study of literary and cultural production by two or more U.S. ethnic populations. Incorporates both literary and socio-

cultural readings of texts. Repeatable under different subtitles.

- ENGL 457. American Indian Literatures 3 cr.
Intensive study of selected topics and genres from American Indian Literatures, such as American Indian oral tradition, the Native American Trickster figure, the development of American Indian fiction, and contemporary American Indian literature. Repeatable once under a different subtitle.
- ENGL 458. Latino/a Literature and Culture 3 cr.
Focuses on established and emergent Latino/a literary and cultural production. Incorporates both literary and sociocultural readings of texts. Repeatable once under a different subtitle.
- ENGL 459. Black Literature and Culture in the United States 3 cr.
Focuses on established and emergent Black U.S. literary and cultural production. Incorporates both literary and sociocultural readings of texts. Repeatable once under a different subtitle.
- ENGL 460. Proposal Writing 3 cr.
Developing proposals and grants in a workshop setting.
- ENGL 462. Interdisciplinary, Client-Based Project Practicum 3 cr.
Hands-on experience in designing projects within interdisciplinary teams for organizational clients. Taught with ENGL 562.
- ENGL 463. Advanced Study in English Literature I 3 cr.
Covers selected works for a particular period of English literary history. Repeatable under different subtitles.
- ENGL 465. Intercultural Professional Communication 3 cr.
Examines rhetorical traditions in intercultural profession, technical, academic, and government contexts.
- ENGL 466. Writing Arguments 3 cr.
Examines critical thinking and other strategies for structuring effective written arguments in various contexts. Considers classical and contemporary approaches to argument. Valuable for students considering law or professional school.
- ENGL 469. Advanced Study in American Literature 3 cr.
Covers selected works for a particular period of American literary history. Repeatable under different subtitles.
- ENGL 470. Approaches to Composition 3 cr.
Theory and practice of teaching writing. Discussion and application of classroom practices, definition of standards, and evaluation of student writing.
- ENGL 473. Writing Assessment and Evaluation 3 cr.
Theory and practice of writing evaluation and program assessment. Examines pedagogical, political, legal, and policy issues involved in assessment. Taught with ENGL 573.
- ENGL 478. Document Design 3 cr.
Advanced study in writing, with an emphasis on the computer as a tool for designing visually informative text. Includes theory and research in document design and the use of page composition and graphics software.
- ENGL 479. Computers and Writing 3 cr.
Examines how computers change the nature of writing and the teaching of writing.
- ENGL 480. Screenwriting II 3 cr.
Students will prepare 30-60 minute screenplays. Script analysis will be in a workshop format. Scripts will be read and discussed, scenes performed and reactions analyzed to consider effect of dialogue, character development, etc. Guest professionals will discuss their experience/expertise. Prerequisite(s): ENGL 309 or CMI 309 or THTR 306 or consent of instructor. Crosslisted with: CMI 480
- ENGL 481. Women's Literature 3 cr.
Intensive study of literature by women, in particular historical, aesthetic, cultural, or intellectual contexts. Repeatable under different subtitles. Crosslisted with: W S 484
- ENGL 482. Gender and Popular Culture 3 cr.
Intensive study of the representations of gender in popular culture. Examines the historical, aesthetic, and cultural contexts of these representation and the various critical and theoretical lenses we use to understand them. Repeatable under different subtitles. Crosslisted with: W S 482
- ENGL 483. Gender and Language 3 cr.
Overview of current and historical approaches to the critical study of gender and language: how gender theoretically manifests in linguistic, social, cultural, academic, and professional texts and contexts.
- ENGL 484. Gender and Literature 3 cr.
Intensive study, critical and theoretical, of intersections between literature and gender. Examines representations or constructions of gender in literary discourse, as well as the gendering of literary activity in different cultural contexts. Repeatable under different subtitles.
- ENGL 486. Hollywood Film 3 cr. (3+3P)
Intensive study of Hollywood film in its artistic, cultural, or historical con-

- texts. Repeatable under different subtitles.
- ENGL 487. Modernist and Experimental Film 3 cr.
Explores the variety of film aesthetics that depart to some degree from the conventions of classical cinema. Focuses on how film form relates to modernist, postmodernist, experimental, and avant-garde tendencies in the arts. Special attention will be paid to the implications of radical formal experimentation for cultural politics, in particular in the context of modern and contemporary history. Repeatable once under a different subtitle.
- ENGL 488. Film and Literature 3 cr.
Intensive study of literary and film texts in particular historical, generic, or cultural contexts, such as Film Adaptation, Religion in Literature and Film, or The American West in Fiction and Film. Repeatable under different subtitles.
- ENGL 489. Cultural Studies: Literature and Theory 3 cr.
Examines the theory and practice of cultural studies in relation to the variety of discourse describable as literary, including autobiography, avant-garde writing, nonfiction prose, the essay, online writing, folklore, and popular genre fiction (such as mystery, romance, thriller, or horror). Repeatable once under a different subtitle.
- ENGL 491. Advanced Screenwriting 3 cr.
Students will prepare a feature-length screenplay. Script analysis will be in an advanced workshop format. Scripts will be read and discussed, scenes performed and reactions analyzed to consider effect of dialogue, character development, etc. Aimed at preparing writers for the professional market. Consent of instructor required. Crosslisted with: CMI 490
- ENGL 492. Old English 3 cr.
An introduction to the language, literature, and culture of Anglo-Saxon England, including Beowulf.
- ENGL 493. Middle English Textual Cultures 3 cr.
Intensive study of cultures of reading, writing, and literary production in late-medieval England, situating Middle English literature in its manuscript contexts. No prior experience with Middle English required.
- ENGL 494. Shakespeare for Educators 3 cr.
In-depth study of selected plays by Shakespeare designed for present and future teachers of literature. Dual emphases on increasing knowledge of Shakespeare's plays in context and on developing effective strategies for teaching them.
- ENGL 497. Internship 3-6 cr.
Supervised technical and professional communication internship in business, industry, government, or the university. Repeatable for a total of 6 credits. Consent of instructor required.
- ENGL 500. Supervised Study 1-3 cr.
To prepare the student for the master's degree examinations by special studies in fields not covered in routine course work. Prerequisite: consent of instructor.
- ENGL 505. Graduate Study in Chaucer 3 cr.
Principal works, with emphasis on the Canterbury Tales. Requirements include independent directed research. Prerequisite: ENGL 261 or consent of instructor.
- ENGL 506. Early Modern Poetry and Prose 3 cr.
Survey of the major authors, genres, and themes of non-dramatic English Literature from 1500 to 1700. Emphasis on how writers of the period invented new literary forms and adapted existing ones to convey their experience of a changing world.
- ENGL 507. Graduate Study in Milton 3 cr.
Studies in Milton's works. Requirements include independent directed research.
- ENGL 508. Graduate Study in Shakespeare I 3 cr.
Principal plays of Shakespeare's first two periods. Requirements include independent directed research.
- ENGL 509. Graduate Study in Shakespeare II 3 cr.
Principal plays of Shakespeare's last two periods. Requirements include independent directed research.
- ENGL 510. Proseminar in Rhetoric and Professional Communication 3 cr.
Introduction to research in rhetoric and professional communication. Taught with ENGL 610.
- ENGL 511. Discourse and Theories 3 cr.
Investigates theories describing how humans use language and considers production, reception, and cultural context. Topics vary. Repeatable for a maximum of 6 credits.
- ENGL 512. Graduate Study in Writing in the Workplace 3 cr.
Study of workplace writing practices, including a focus on research-based, theoretical, and pedagogical approaches to professional communication.
- ENGL 513. Creative Writing Workshop: Fiction 3 cr.
Advanced creative writing prose workshop. Imaginative writing, chiefly the narrative. Graduate level workshop for students who are not in the English Department MFA program. Repeatable for a maximum of 12 credits. Taught with ENGL 413 with additional work required at the graduate level.
- ENGL 514. Creative Writing Workshop: Poetry 3 cr.
Creative writing poetry workshop for advanced writers of poetry. Graduate level works for students who are not in the English Department MFA program. Repeatable for a maximum of 12 credits. Taught with ENGL 414 with additional work required at the graduate level.
- ENGL 515. Creative Writing Workshop: Playwriting 3 cr.
Advanced creative writing workshop in playwriting. Repeatable for up to 12 credits. Taught with ENGL 415.
- ENGL 516. Graduate Study in Approaches to Literature 3 cr.
Understanding, appreciation, techniques of instruction in the high school. Requirements include independent directed research. Prerequisite: at least 6 credits in upper-division English courses.
- ENGL 517. Graduate Study in Critical Theory 3 cr.
Advanced study of one or more major trends in theoretical inquiry within English studies. Some prior study of theory, such as English 301, 302, or 303, strongly recommended. Repeatable under different subtitles.
- ENGL 518. History of Rhetoric 3 cr.
An investigation of the crucial writings that have shaped Western attitudes towards and practice of rhetoric. Course will examine key texts from the Greeks through the Enlightenment, especially as they have influenced contemporary rhetorical theory.
- ENGL 519. Graduate Study in Modern Rhetorical Theory 3 cr.
Major figures in rhetorical theory, with particular emphasis on developments in rhetorical theory in the 20th century. Students will be responsible for all requirements of ENGL 419 and will in addition undertake independent directed research.
- ENGL 520. Workshop: Advanced Composition 3 cr.
Intensive work in composition in a workshop setting.
- ENGL 521. Graduate Study in a Literary Period or Movement 3 cr.
Close study of a topic in a particular literary period or movement. Requirements include independent directed research. Repeatable under different subtitles.
- ENGL 522. Graduate Study in a Literary Form or Genre 3 cr.
Close study of a topic in a particular literary form or genre. Requirements include independent directed research. Repeatable under different subtitles.
- ENGL 523. Graduate Study of a Major Author 3 cr.
Close study of selected works of a major author. Requirements include independent directed research. Repeatable under different subtitles.
- ENGL 524. Graduate Study in a Major Text 3 cr.
Close study of a major text. Requirements include independent directed research. Repeatable under different subtitles.
- ENGL 525. Graduate Study in Comparative Literature 3 cr.
Close study of a selection on non-English literary works read in translation. English-language works from a similar literary period or genre may also be read. Requirements include independent directed research. Prerequisite: graduate standing or consent of instructor. Repeatable under different subtitles.
- ENGL 526. Special Topics in Critical Theory 3 cr.
Study of a specific historical or theoretical topic, trend, or movement in Critical Theory. Repeatable under different subtitles.
- ENGL 527. Graduate Study in Film and Digital Media 3 cr.
Offers close graduate study of a form or genre, a major figure or style, a historical period or movement, or a major theme or text. Topics vary from semester to semester.
- ENGL 528. Drama from the Renaissance to the Restoration 3 cr.
Survey of the major authors, genres, and themes of sixteenth- and seventeenth-century drama in England, with particular emphasis on Renaissance revenge tragedy, marriage comedy, and city comedy, and on Restoration comedy of manners.
- ENGL 529. British Romanticism 3 cr.
Intensive study of major writers and critical topics from the Romantic period. Repeatable under different subtitles.
- ENGL 530. Argument Theory and Practice 3 cr.
Examining theories of argument and how language convinces audiences to think and act in certain ways and not in others. Investigates argument across disciplines and in social/political contexts.
- ENGL 531. Technical Editing 3 cr.
Uses workshops, readings, hands-on projects, and discussion to improve skills in gathering, writing, designing, and editing technical information. For students interested in technical communication as well as students interested in developing strengths in communicating in scientific and technical

- fields.
- ENGL 532. Gothic Literature 3 cr.
Intensive study of gothic literature in particular historical, aesthetic, cultural, or intellectual contexts, such as American Gothic, Female Gothic, Dark Romanticism, or Vampire Literature. Repeatable under different subtitles.
- ENGL 533. Victorian Literature 3 cr.
Intensive study of major writers and critical topics from the Victorian period. Repeatable under different subtitles.
- ENGL 534. Graduate Study: Form and Technique in Fiction 3 cr.
Advanced study of issues in form and technique in fiction, including point of view, scene and dialogue, and story structure. Repeatable for a maximum of 6 credits.
- ENGL 535. Graduate Study: Form and Technique in Poetry 3 cr.
Advanced study of issues in form and technique in poetry, including voice, tone, syntax, and structure. Repeatable for a maximum of 6 credits.
- ENGL 536. The Borderlands Writing Project 3-6 cr.
Intensive month-long seminar for practicing teachers and educators designed to improve the teaching of writing and the writing process and literacy and reading in schools and other educational contexts. Reading, discussing, and writing about current professional literature; completing teacher inquiry; and planning action research. Participants complete personal and professional writing, as well as additional professional development activities. By invitation only. Affiliated with the National Writing Project. Consent of instructor required. Crosslisted with: RDG 536
- ENGL 537. Practitioner Inquiry and Literacy Action Research 1-3 cr.
Inquiry concerning literacy practices within specific contexts and the planning, implementing, and assessing projects designed to increase and improve literacy within that context. Instruction includes reading and web-based discussion, bi-monthly seminars, and onsite consultations. Associated with ongoing community outreach by the English Department and the Borderlands Writing Project. Consent of instructor required.
- ENGL 538. Literature of the American Renaissance 3 cr.
Intensive study of topics critical to the development of nineteenth century American literature before and during the Civil War, and the work of authors such as Emerson, Thoreau, Poe, Hawthorne, Melville, Whitman and Dickinson. Repeatable once under a different subtitle.
- ENGL 539. American Realism and Naturalism 3 cr.
Key works of literary realism and naturalism, Civil War to World War I. Course readings vary, but will normally include works of Henry James, Edith Wharton, Willa Cather, Theodore Dreiser, as well as others. Repeatable once under a different subtitle.
- ENGL 540. Harlem Renaissance and Modernism 3 cr.
Reading and study of key works of the flowering of African American literature known as the Harlem Renaissance of the 1920s and 1930s. Consideration of the literary context of the Harlem Renaissance, which includes both African American and non-African American writers of the early modern and modern periods.
- ENGL 541. Modern and Contemporary American Fiction 3 cr.
Studies the development of American fiction from World War I to the present. Repeatable once under a different subtitle.
- ENGL 542. Modern and Contemporary American Poetry 3 cr.
Studies the development of American poetry from World War I to the present. Repeatable once under a different subtitle.
- ENGL 543. Multimedia Theory and Production 3 cr.
Issues, theories, and production practices underlying design of multimedia, including rhetorical choices, aesthetic approaches, usability concerns, and diverse academic and popular discourses contributing to continued development of digital texts. Taught with ENGL 643.
- ENGL 544. Modern British Fiction 3 cr.
Study of the fiction produced in the British Isles in the 20th and 21st centuries. Repeatable once under a different subtitle.
- ENGL 545. Postmodern Fiction 3 cr.
Study of the various forms of formally innovative experimental fiction produced since 1945, with a focus on the relationship between literary history and its sociohistorical contexts. Some texts will be read in translation. Repeatable once under a different subtitle.
- ENGL 546. Ethics and Ethos in Rhetoric and Professional Communication 3 cr.
Study of the history, theory, and practice of applied ethics and rhetorical concept of ethos.
- ENGL 547. Graduate Study in Rhetorical Invention 3 cr.
Various theories and means of invention, including practical applications for the writer. Requirements include independent directed research.
- ENGL 548. Graduate Study in Empirical Research 3 cr.
Introduction to empirical research methods in composition, professional communication, and rhetoric.
- ENGL 549. Graduate Study in Writing 3 cr.
Close study of a topic in composition, rhetoric, and/or technical and professional communication. Topics vary. Repeatable for a maximum of 6 credits.
- ENGL 550. Graduate Study in Literacy 3 cr.
Studies in literacy theory and literacy research. Topics may vary. Taught with ENGL 650.
- ENGL 551. Practicum in the Grammar of American English 3 cr.
Studies of formal grammar of the English language in preparation for the teaching of the English language and/or advanced linguistic analysis. Taught with ENGL 451.
- ENGL 552. Graduate Study in History of the English Language 3 cr.
This course examines the history of the English language from its Indo-European origins through its development into an international language. The aim is to describe the English language formally and to trace linguistic change over time. Samples of written English will illustrate various stages in the development of English. Also considered are contemporary social and political issues related to language, including the problem of 'standard English' and the uses of language in advertising, the media, and politics.
- ENGL 553. World Literatures 3 cr.
Study of one or more literary traditions exclusive of those originating in Europe and the United States. Readings will include texts in translation. Repeatable once under a different subtitle.
- ENGL 554. Postcolonial Literature 3 cr.
Study of the transformations of literature and theory produced in the context of decolonization and its aftermath, from the twentieth century to the present. Some texts will be read in translation. Repeatable once under a different subtitle.
- ENGL 555. Graduate Study in Rhetoric of Scientific Literature 3 cr.
Intensive study of the rhetoric of selected works of scientific literature.
- ENGL 556. Ethnic Studies in US Literature and Culture 3 cr.
Concentrates on comparative study of literary and cultural production by two or more U.S. ethnic populations. Incorporates both literary and socio-cultural readings of texts. Repeatable under different subtitles.
- ENGL 557. American Indian Literatures 3 cr.
Intensive study of selected topics and genres from American Indian Literatures, such as American Indian oral tradition, the Native American Trickster figure, the development of American Indian fiction, and contemporary American Indian literature. Repeatable once under a different subtitle.
- ENGL 558. Latino/a Literature and Culture 3 cr.
Focuses on established and emergent Latino/a literary and cultural production. Incorporates both literary and sociocultural readings of texts. Repeatable once under a different subtitle.
- ENGL 559. Black Literature and Culture in the United States 3 cr.
Focuses on established and emergent Black U.S. literary and cultural production. Incorporates both literary and sociocultural readings of texts. Repeatable once under a different subtitle.
- ENGL 560. Proposal and Grant Writing 3 cr.
Developing proposals and grants in a workshop setting.
- ENGL 561. Topics in Writing Program Administration 3 cr.
Explores issues, theories, and research underlying the design of writing programs and the administration of writing centers. Repeatable for a maximum of 6 credits. Taught with ENGL 661.
- ENGL 562. Interdisciplinary, Client-Based Project Practicum 3 cr.
Hands-on experience in collaborating with interdisciplinary teams designing projects for organizational clients. Taught with ENGL 462.
- ENGL 563. Graduate Study in English Literature 3 cr.
Covers selected works for a particular period of English literary history. Repeatable under different subtitles.
- ENGL 564. History and Theory of Composition Studies 3 cr.
Studies in the history and theory of composition as a discipline. Taught with ENGL 664.
- ENGL 565. Intercultural Rhetoric and Professional Communication 3 cr.
Examines rhetorical traditions in intercultural professional, technical, academic, and governmental contexts. Taught with ENGL 665.
- ENGL 566. Online Pedagogy for Writing and Professional Communication 3 cr.
Course explores key issues related to teaching and learning in online environments, with a focus on the teaching of writing and professional communication. Examines digital classroom practices and the theories that inform them and evaluates applicability and relevance of available technologies.
- ENGL 567. Documentary Film Theory and Criticism 3 cr. (3+3P)
Course offers critical survey of documentary film theory and criticism including considerations of the epistemological assumptions, rhetorical choices, aesthetic approaches, political circumstances of historical and contemporary documentary film.

- ENGL 568. Rhetoric and Cultural Studies 3 cr.
Explores intersections between rhetoric and cultural studies. Examines theories and practices of texts and discourses in political and cultural contexts. Taught with ENGL 668.
- ENGL 569. Graduate in American Literature 3 cr.
A group of works from a particular period of American literary history. Repeatable under different subtitles.
- ENGL 570. Graduate Study in Approaches to Composition 3 cr.
Theory and practice of teaching writing, including classroom practices, definition of standards, and evaluation of student writing. Requirements include independent directed research.
- ENGL 571. Composition Pedagogy and Practicum 3 cr.
Examines the pedagogical implications of contemporary composition theory and research. Focuses on teaching composition at the college level. Consent of instructor required.
- ENGL 572. Technical-Professional Communication: Theory and Pedagogy 3 cr.
Topics in teaching business, technical and scientific communication in academic and workplace contexts. Prerequisite: graduate standing.
- ENGL 573. Writing Assessment and Evaluation 3 cr.
Theory and practice of writing evaluation and program assessment. Examines pedagogical, political, legal, and policy issues involved in assessment. Taught with ENGL 473.
- ENGL 574. Workshop: Advanced Writing Prose 3 cr.
Intensive practice in prose writing, primarily fiction, in a workshop environment with peer criticism. Repeatable for a total of 15 credits. Consent of instructor required.
- ENGL 575. Workshop: Advanced Writing Poetry 3 cr.
Intensive practice in poetry writing in a workshop environment with peer criticism. Repeatable for a total of 15 credits. Consent of instructor required.
- ENGL 576. Workshop: Advanced Writing Playwriting 3 cr.
Intensive practice in dramatic writing in a workshop environment with peer criticism. Repeatable for a total of 9 credits. Consent of instructor required.
- ENGL 577. Workshop: Advanced Technical and Professional Writing 3 cr.
Intensive practice in technical and professional writing and editing in a workshop environment. Repeatable for a total of 6 credits. Consent of instructor required.
- ENGL 578. Topics in Rhetoric and Technology 3 cr.
Explores intersections between rhetoric and technology, approaches may highlight theory, media production, and/or research. Repeatable for a maximum of 6 credits. Taught with ENGL 678.
- ENGL 579. Computers and Writing 3 cr.
Examines how computers change the nature of writing and the teaching of writing.
- ENGL 580. Graduate Problems in Creative Writing 3 cr.
Independent study in creative writing. Consent of instructor required. Repeatable for a total of 9 credits.
- ENGL 581. Women's Literature 3 cr.
Intensive study of literature by women, in particular historical, aesthetic, cultural, or intellectual contexts. Repeatable under different subtitles. Crosslisted with: W S 584
- ENGL 582. Gender and Popular Culture 3 cr.
Intensive study of the representations of gender in popular culture. Examines the historical, aesthetic, and cultural contexts of these representation and the various critical and theoretical lenses we use to understand them. Repeatable under different subtitles. Crosslisted with: W S 582
- ENGL 583. Gender and Language 3 cr.
Overview of current and historical approaches to the critical study of gender and language: how gender theoretically manifests in linguistic, social, cultural, academic, and professional contexts.
- ENGL 584. Gender and Literature 3 cr.
Intensive study, critical and theoretical, of intersections between literature and gender. Examines representations or constructions of gender in literary discourse, as well as the gendering of literary activity in different cultural contexts. Repeatable under different subtitles.
- ENGL 585. Preparing a Professional Portfolio 3 cr.
Students will study the genre of professional portfolios and develop one of their own to showcase work completed during their program of study.
- ENGL 586. Hollywood Film 3 cr. (3+3P)
Intensive study of Hollywood film in its artistic, cultural, or historical contexts. Repeatable under different subtitles.
- ENGL 587. Modernist and Experimental Film 3 cr.
Explores the variety of film aesthetics that depart to some degree from the conventions of classical cinema. Focuses on how film form relates to modernist, postmodernist, experimental, and avant-garde tendencies in the arts. Special attention will be paid to the implications of radical formal experimentation for cultural politics, in particular in the context of modern and contemporary history. Repeatable once under a different subtitle.
- ENGL 588. Film and Literature 3 cr.
Intensive study of literary and film texts in particular historical, generic, or cultural contexts, such as Film Adaptation, Religion in Literature and Film, or The American West in Fiction and Film. Repeatable under different subtitles.
- ENGL 589. Cultural Studies: Literature and Theory 3 cr.
Examines the theory and practice of cultural studies in relation to the variety of discourse describable as literary, including autobiography, avant-garde writing, nonfiction prose, the essay, online writing, folklore, and popular genre fiction (such as mystery, romance, thriller, or horror). Repeatable once under a different subtitle.
- ENGL 590. Master's Seminar in Rhetoric 3 cr.
Studies in theories of and issues in rhetoric. Topics may vary from year to year. Repeatable for a total of 9 credits.
- ENGL 591. Graduate Screenwriting 3 cr.
Students will prepare a feature-length screenplay. Script analysis will be in an advanced workshop format. Scripts will be read and discussed, scenes performed and reactions analyzed to consider effect of dialogue, character development, etc. Aimed at preparing writers for the professional market. Consent of instructor required.
- ENGL 592. Old English 3 cr.
An introduction to the language, literature, and culture of Anglo-Saxon England, including Beowulf.
- ENGL 593. Middle English Textual Cultures 3 cr.
Intensive study of cultures of reading, writing, and literary production in late-medieval England, situating Middle English literature in its manuscript contexts. No prior experience with Middle English required.
- ENGL 594. Shakespeare for Educators 3 cr.
In-depth study of selected plays by Shakespeare designed for present and future teachers of literature. Dual emphases on increasing knowledge of Shakespeare's plays in context and on developing effective strategies for teaching them.
- ENGL 595. Master's Workshop: Poetry 3-6 cr.
Students will submit a draft of thesis project for workshop critique. Revision of the thesis draft submitted to the instructor. Prerequisite(s): Enrolled in MFA penultimate semester. Restricted to MFA CW majors.
- ENGL 596. Master's Workshop 3-6 cr.
Students will submit a draft of thesis project for workshop critique. Revision of the thesis draft submitted to the instructor. Prerequisite(s): Enrolled in MFA penultimate semester. Restricted to MFA CW majors.
- ENGL 597. Internship in Technical and Professional Communication 3-6 cr.
Supervised technical and professional communication in business, industry, government, or the university. May be repeated for a total of 6 credits. Consent of instructor required.
- ENGL 598. Master's Essay 3 cr.
Students electing the master essay option complete revision of a scholarly essay of 25-30 pages, the approximate length of a journal article, and reformulation of this essay to the 7-8 pages appropriate for presentation at a conference. This option also requires research of appropriate publication venues and a final oral defense of the project. A supervising faculty member will approve the selected essay, guide revision, and help students form an examining committee, which consists of at least two members of the graduate English faculty and one member of the graduate faculty from outside the department. Students are encouraged to undertake the Master Essay process in the first half of their third semester of full time graduate work, or soon after completing 18 hours of course work. This option is the preferred exam option, particularly for those students who intend to pursue Ph.D. study. Consent of instructor required.
- ENGL 599. Master's Thesis 0-88 cr.
Thesis.
- ENGL 600. Doctoral Research 1-88 cr.
Assigns credit for research performed prior to the doctoral comprehensive examination.
- ENGL 601. Qualitative Research 3 cr.
Theory and practice of designing research studies and of collecting and analyzing data. Emphasis on qualitative methods of research in composition, professional communication, and rhetoric.
- ENGL 602. Quantitative Research 3 cr.
Theory and practice of designing quantitative research studies and of collecting and analyzing data. Emphasis on quantitative methods of research in composition, professional communication, and rhetoric.
- ENGL 603. Rhetorical Criticism and Methodology 3 cr.
Theory and practice of designing research studies and of collecting and

analyzing data. Emphasis on methods of rhetorical criticism.		
ENGL 610. Proseminar in Rhetoric and Professional Communication	3 cr.	Introduction to research in rhetoric and professional communication. Required of and limited to students enrolled in the Ph.D. program in Rhetoric and Professional Communication.
ENGL 643. Multimedia Theory and Production	3 cr.	Issues, theories, and production practices underlying design of multimedia, including rhetorical choices, aesthetic approaches, usability concerns, and diverse academic and popular discourses contributing to continued development of digital texts. Taught with ENGL 543.
ENGL 649. Graduate Study in Writing	3 cr.	Close study of a topic in composition, rhetoric, and/or technical and profession communication. Repeatable for a total of 6 credits.
ENGL 650. Graduate Study in Literacy	3 cr.	Studies in literacy theory and literacy research. Topics may vary. Taught with ENGL 550.
ENGL 661. Topics in Writing Program Administration	3 cr.	Explores issues, theories, and research underlying writing programs and the administration of writing centers. Repeatable for a maximum of 6 credits. Taught with ENGL 561.
ENGL 664. History and Theory of Composition Studies	3 cr.	Studies in the history and theory of composition as a discipline. Taught with ENGL 564.
ENGL 665. Intercultural Rhetoric and Professional Communication	3 cr.	Examines rhetorical traditions in intercultural professional, technical, academic, and governmental contexts. Taught with ENGL 565.
ENGL 667. Documentary Film Theory and Criticism	3 cr. (3+3P)	Course offers critical survey of documentary film theory and criticism including considerations of the epistemological assumptions, rhetorical choices, aesthetic approaches, and political circumstances of historical and contemporary documentary film. Taught with ENGL 567
ENGL 668. Rhetoric and Cultural Studies	3 cr.	Explores intersections between rhetoric and cultural studies. Examines theories and practices of texts and discourses in political and cultural contexts. Taught with ENGL 568.
ENGL 678. Topics in Rhetoric and Technology	3 cr.	Explores intersections between rhetoric and technology, approaches may highlight theory, media production, and/or research. Repeatable for a maximum of 6 credits. Taught with ENGL 578.
ENGL 690. Doctoral Seminar in Rhetoric	3 cr.	Studies in theories of and issues in rhetoric. Topics may vary from year to year. Repeatable for a maximum of 9 credits.
ENGL 699. Research Practicum	3 cr.	Designing and conducting individual research projects, for students engaged in dissertation research.
ENGL 700. Doctoral Dissertation	0-88 cr.	Dissertation.

GEOGRAPHY

Department website: <http://www.nmsu.edu/~geoweb/>
(575) 646-3509

C. P. Brown, Ph.D., department head (California-Santa Barbara/San Diego State)-geographic information systems, water resources, U.S.-Mexico border environmental issues; M. Buenemann, Ph.D. (Oklahoma)-arid environments, cartography, remote sensing; C. L. Campbell, Ph.D. (UCLA)-biogeography, landscape ecology, remote sensing; R. J. Czerniak, Ph.D. (Colorado-Boulder)-land use and transportation planning, Europe, urban geography; M. N. DeMers, Ph.D. (Kansas)-geographic information systems, landscape ecology, geographic education; D. Dugas, Ph.D. (Oregon)-geomorphology, physical geography; J. B Wright, Ph.D. (California- Berkeley)- environmental conservation, cultural geography, American West.

DEGREE: Master of Applied Geography

MINOR: Geographic Information Science and Technology (GIS&T)

The Department of Geography offers graduate study leading to the Master of Applied Geography degree. A minor in Geographic Information Science and Technology (GIS &T) is also available for all graduate students, regardless of major; details are provided below. Admission to the program is in accord with

the general regulations of the Graduate School. Foreign students must receive a minimum score of 570 on the paper-based or 230 on the computer-based on the Test of English as a Foreign Language (TOEFL) examination. Any applicant who does not have an adequate undergraduate background in geography will be required to make up the deficiencies. Applicants must submit three letters of recommendation.

The basic requirement for the Master of Applied Geography is a minimum of 30 graduate credits including 6 thesis credits. A non-thesis option requires 36 graduate credits with a minimum of 3 credits of professional residency and an approved final research report. All candidates must maintain an overall GPA or 3.00 or higher. All candidates must receive a grade of B- or better in the following required courses: GEOG 501, Research Design; GEOG 585, Advanced Spatial Analysis; and one graduate-level GIS course either prior to entering the program or before graduation. A total of at least 15 credits must be earned in courses numbered 500 and above, and at least 15 graduate credits must be in geography.

The department has a contract research laboratory (Spatial Applications Research Center-SPARC) and a computer teaching laboratory, both of which support the full suite of ESRI, ERDAS, and ENVI geo-spatial analytical software. The contract research laboratory employs graduate students who work with local and state governments and research agencies, as well as with businesses on applied geography projects. Our teaching laboratory is used by graduate students for course work and short-term research projects. The department has good working relationships with the Water Resources Research Institute, the Jornada Experimental Range, the Physical Sciences Laboratory, and other units on campus. The department has its own field equipment and field vehicle, which graduate students can use to support their thesis research. The potential for financial support exists for graduate students in geography through teaching assistantships and research assistantships. Inquiries regarding the program and assistantships should be directed to the Dr. Daniel Dugas, Geography Graduate Director (ddugas@nmsu.edu). Financial aid questions should be addressed to the Office of Financial Aid at NMSU.

MINOR: Geographic Information Science and Technology (GIS&T)

The department of Geography offers a minor in Geographic Information Science and Technology (GIS &T), and this minor is available for all graduate students. To earn a minor in GIS & T, the following courses are required, combining for a total of 13 credits. Students may not take any of these courses S/U.

The following two classes are mandatory requirements for the minor:

GEOG 573, Introduction to Remote Sensing.....	3
GEOG 578, Fundamentals of Geographic Information Systems.....	4

TWO of the following four optional classes are also required:

GEOG 521, GIS Applications and Modeling	3
GEOG 572, Geodatabase Design	3
GEOG 581, GIS Design.....	3
GEOG 582, Advanced Remote Sensing	3

GEOGRAPHY

GEOG 452. Landscape Ecology	3 cr.	Analysis of the structure, function and change of natural and anthropogenic landscapes. Patches, corridors, matrix and network, spatial organization, landscape dynamics, and role of disturbance in overall functioning of landscapes. Role of landscape heter. Prerequisite(s): Either GEOG 351, BIOL 301, or other basic ecology course or consent of instructor.
GEOG 461. U.S. Mexico Border Development	3 cr.	Analysis of the socioeconomic development of the U.S.-Mexican border region, including perspectives and issues from both sides of the border. Opportunities for individualized study of contemporary issues in the region. Prerequisite: GEOG 361 or consent of instructor.
GEOG 467. Transportation Geography	3 cr.	Nature and distribution of land, air and water transport facilities and their importance in regional development. Prerequisite: GEOG 120G or consent of instructor.
GEOG 472. Soil Morphology and Classification	4 cr. (2+2P)	Same as SOIL 472.
GEOG 473. Advanced Remote Sensing	4 cr. (3+3P)	Introduction to advanced topics in digital image processing, analysis, interpretation, and visualization. Topics include geometric and radiometric correction, image enhancement, image classification, change detection, and accuracy assessment. Lectures focus on the discussion of advanced

- remote sensing concepts, techniques, and applications; labs are applications-oriented. Prerequisite(s): GEOG 373, Intro to Remote Sensing.
- GEOG 481. Fundamentals of Geographic Information Systems** 4 cr. (3+3P)
Fundamentals of computer-based systems which organize, analyze, and present spatially referenced data. Prerequisite: GEOG 281 or GEOG 381.
- GEOG 482. Geodatabase Design** 3 cr. (2+3P)
A practical introduction to designing geodatabases. The course takes you through the eleven steps of geodatabase design divided into four stages: thematic characterization; developing the database elements, relationships and properties; capture and collection; and finally, implementation and documentation. Prerequisite(s): GEOG 481 or consent of instructor.
- GEOG 483. Field Explorations in Geography** 3 cr. (6P)
A field-based class where students complete exercises in physical, human, and environmental geography in the Southwest. May be offered as a two-week intensive class where students are away from Las Cruces and camping; or may be offered with weekend field trips depending on the instructor. A lab fee for transportation and other expenses is required. Prerequisite(s): Geography 281, physical geography class, human geography class, or equivalents, or consent of instructor.
- GEOG 487. GIS Capstone** 3 cr. (2+3P)
A capstone course in Geospatial Analysis. Demonstration of competence in the use of Geospatial tools, techniques, and concepts for the solution of applied geographic problems. Software may change from semester to semester. Prerequisite(s): GEOG 373 and GEOG 481.
- GEOG 491. Special Topics** 1-3 cr.
Specific subjects to be announced in the Schedule of Classes. May be repeated for a maximum of 12 credits. Consent of instructor required.
- GEOG 492. GIS Applications and Modeling** 3 cr.
Group oriented class in which students conduct an applied research project in GIScience application or modeling area of choice and conduct focused library research. Prerequisite(s): GEOG 481 or consent of instructor.
- GEOG 493. Special Problem Research** 1-3 cr.
For advanced and exceptional students. Research, and preparation of a paper in some phase of geography. A maximum of 6 credits may be earned. Consent of instructor required.
- GEOG 495. Directed Readings** 1-3 cr.
Individual study through selected readings. A maximum of 6 credits may be earned. Consent of instructor required.
- GEOG 501. Research Design and History of Geographic Thought** 3 cr.
Understanding and application of the research process, including conceptualization and definition of a research problem, study designs, data sources, data collection, and report writing in development of geographic thought.
- GEOG 521. GIS Applications and Modeling** 3 cr.
Group oriented class in which students conduct an applied research project in a GIScience application or modeling area of choice and conduct focused library research. Prerequisite(s): GEOG 481, or consent of instructor.
- GEOG 552. Landscape Ecology** 3 cr.
Analysis of the structure, function and change of natural and anthropogenic landscapes. Patches, corridors, matrix and network, spatial organization, landscape dynamics, and role of disturbance in overall functioning of landscapes. Role of landscape heterogeneity in landscape management. Prerequisite: either GEOG 351, BIOL 301, or other basic ecology course or consent of instructor. Same as BIOL 552.
- GEOG 553. Applied Geomorphology** 3 cr. (2+3P)
Geomorphic concepts applied to human activities that affect landforms. Prerequisite: GEOG/GEOI 353 or GEOG/GEOI 453 or consent of instructor. Same as GEOI 553.
- GEOG 555. Graduate Level Southwestern Environments** 3 cr.
The U.S. Southwest: physical and human geography, coupled human-environment interactions, causes and consequences of environmental issues, and implications for sustainable development. Prerequisite(s): GEOG 281, physical geography class, human geography class, or equivalents, or consent of instructor.
- GEOG 557. Biogeography** 3 cr.
Global distributions of plants and animals: their origins, radiations, and factors controlling distribution.
- GEOG 571. Cartography and Geographic Information Systems** 3 cr. (2+3P)
Graduate level design and construction of thematic maps. Introduction to cartographic principles in lecture. Emphasis on map-making using GIS software in the labs. Prerequisite(s): GEOG 281.
- GEOG 572. Graduate Geodatabase Design** 3 cr. (2+3P)
Graduate level introduction to designing geodatabases. The course takes you through the eleven steps of geodatabase design divided into four stages: thematic characterization; developing the database elements, relationships and properties; capture and collection; and finally implementation and documentation. Taught with GEOG 482. Prerequisite(s): GEOG 382.
- GEOG 573. Introduction to Remote Sensing** 3 cr.
Introduction to the theory, techniques, and applications of remote sensing. Topics include electromagnetic radiation; remote sensing systems; remote sensing of the biosphere, hydrosphere, atmosphere, lithosphere, and cultural landscapes. Course includes lectures and also labs focused on the basic analysis and interpretation of remote sensing products.
- GEOG 577. GIS CAPSTONE** 3 cr.
Graduate level capstone course in geospatial analysis. Demonstration of competence in the use of Geospatial tools, techniques, and concepts for the solution of applied geographic problems. Software may change from semester to semester. Prerequisite(s): GEOG 373 and 481.
- GEOG 578. Fundamentals of Geographic Information Systems** 4 cr. (3+3P)
Fundamentals of computer-based systems that organize, analyze, and present spatially referenced data. Prerequisite(s): GEOG 571 or consent of instructor.
- GEOG 581. GIS Design** 3 cr.
A critical aspect of GIS is its ability to provide the necessary products within the organization within which it is implemented. This is an in-depth analysis of currently accepted planning methodologies designed to create a successful implementation of GIS inside organizations. Prerequisite(s): GEOG 481 or consent of instructor.
- GEOG 582. Advanced Remote Sensing** 3 cr.
Introduction to advanced topics in digital image processing, analysis, interpretation, and visualization. Topics include geometric and radiometric correction, image enhancement, image classification, change detection, and accuracy assessment. Lectures focus on the discussion of advanced remote sensing concepts, techniques, and applications; labs are applications-oriented. Prerequisite(s): GEOG 373/573 or consent of instructor.
- GEOG 583. Field Explorations in Geography** 3 cr. (6P)
A field-based class where students complete exercises in physical, cultural, and environmental geography in the Southwest. May be offered as a two-week intensive class where students are away from Las Cruces and camping; or may be offered with weekend field trips depending on the instructor. A lab fee for transportation and other expenses is required. Prerequisite(s): Geography 281, physical geography class, human geography class, or equivalents, or consent of instructor.
- GEOG 585. Advanced Spatial Analysis** 3 cr.
Statistical analyses of point and areal patterns. Emphasis on quantitative research in geography. Prerequisite: STAT 251G or E ST 311; or consent of instructor.
- GEOG 586. Geospatial Techniques for Natural Resource Assessments** 3 cr.
Use of integrated geographic information science and technology (GIS&T, includes remote sensing and geographic information systems) approaches for the monitoring and assessment of environmental issues. Lectures focus on the analysis and evaluation of current uses, potentials, and challenges of GIS&T. Labs emphasize the design and implementation of an original research project that uses GIS&T to model a local or regional environmental issue. Prerequisite(s): Geography 481/521 and 373/573 or equivalents.
- GEOG 595. Directed Readings** 1-3 cr.
Advanced individual study through selected readings. May be repeated for a maximum of 6 credits.
- GEOG 596. Residency** 3-12 cr.
A contractual learning experience in the public or private sector under the supervision of a field supervisor and two faculty members. Restricted to majors. PR/U grading only.
- GEOG 597. Seminar in Advanced Digital Imagery** 3 cr.
Supervised group study of geospatial techniques using advanced digital imagery. May be repeated for a maximum of 6 credits when topics change. Prerequisite: Graduate standing or consent of instructor.
- GEOG 598. Selected Topics** 1-3 cr.
Readings, discussions, lectures or laboratory studies of selected geographic themes. May be repeated for unlimited credit.
- GEOG 599. Master's Thesis** 0-12 cr.
Supervised individual study of a student's thesis topic. May be repeated for an unlimited number of credits.

PLANNING

- PLAN 493. Special Problem Research** 1-3 cr.
For advanced and exceptional students. Research paper in some phase of city and/or regional planning. Maximum of 6 credits. Prerequisite: consent of instructor.

PLAN 495. Directed Readings 1-3 cr.
Individual study through readings. A maximum of 6 credits may be earned.
Prerequisite: consent of instructor.

GEOLOGICAL SCIENCES

Department website: <http://www.nmsu.edu/~geology/>
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N. J. McMillan, department head, Ph.D. (Southern Methodist)-igneous petrology, geochemistry; J. M. Amato, Ph.D. (Stanford)-structural geology, tectonics; K.A. Giles, Ph.D. (Arizona)-carbonate sedimentology, paleontology; T. F. Lawton, Ph.D. (Arizona)-stratigraphy, basin analysis; G. H. Mack, Ph.D. (Indiana-Bloomington)-sedimentary petrology, sedimentology; F. C. Ramos, Ph.D. (California- Los Angeles)-isotope geochemistry, petrology; T. H. Giordano (Emeritus), Ph.D. (Penn State-University Park)-geochemistry, ore deposits; W. R. Seager (Emeritus), Ph.D. (Arizona)-structural geology, tectonics

DEGREE: Master of Science
MAJOR: Geology

The Department of Geological Sciences offers graduate study leading to the Master of Science degree in geology. Admission to the program is in accord with the general regulations of the Graduate School. Admission to this program without deficiency is based on an undergraduate program essentially equivalent to that pursued by a geology major at this university. The Graduate Record Examination (verbal and quantitative only) is required. A candidate for a master's degree must complete a minimum of 30 graduate credits, including a minimum of 6 credits for thesis (GEOL 599). No more than 5 thesis credits may be taken in any one semester. Early selection of a research advisor is encouraged. A thesis proposal must be approved by the advisor and the candidate's committee before registering for thesis credits. At least 15 credits must be earned in courses numbered 500 or above, and at least 15 credits must be earned in geology. Students are expected to register for and participate in the department's colloquium each semester. Supportive graduate work is available in geological engineering and geophysics. The department offers excellent laboratory facilities for research in mineralogy, igneous petrology, geochemistry, stratigraphy, paleontology, and sedimentology. Available are a large, fully equipped rock preparation laboratory, mineral separation laboratory, plus computer, geochemical and petrographic labs. Major equipment includes a Gemeni heavy mineral separation table, X-Ray Fluorescence Spectrometry (XRF), Laser-Induced Breakdown Spectroscopy (LIBS), and Thermal Ionization Mass Spectrometry (TIMS). The department maintains its own fleet of field vehicles. Also available are computing facilities that include an HP color plotter and GIS system. Financial support is available to graduate students in geology through teaching and research assistantships and scholarships. Inquiries regarding financial aid should be directed to the graduate advisor.

GEOLOGICAL SCIENCES

- GEOL 452. Geohydrology 3 cr.
Origin, occurrence, and movement of fluids in porous media assessment of aquifer characteristics. Development and conservation of ground water resources, design of well fields. Prerequisite(s): GEOL 111G and C E 231. Crosslisted with: C E 452 and E S 452
- GEOL 454. Advanced Stratigraphic Concepts 3 cr.
Geometry and origin of strata, emphasizing techniques for correlation and interpretation. Prerequisite: GEOL 420 or equivalent.
- GEOL 455. Applied Geology 1-3 cr.
Geological research and field projects for the advanced student. May be repeated for a total of 6 credits. Prerequisite: consent of instructor.
- GEOL 465. Isotope Geochemistry 3 cr.
Geochemistry of stable and radiogenic isotopes and its application to a wide range of problems in the earth and planetary sciences. Prerequisite(s): CHEM 112G, GEOL 360, GEOL 399.
- GEOL 470. Structural Geology 3 cr. (2+3P)
Deformation of rocks of the earth. Prerequisite: GEOL 310
- GEOL 474. Ground Water Geology 3 cr.
Steady-state and transient ground-water flow in porous media: effects of lithology on hydrologic characteristics of aquifers and confining units;

Darcy's Law applied to steady-state flow; distribution of hydraulic head in confined and unconfined aquifers; recharge and discharge in regional and local ground-water flow systems; ground-water surface-water interaction; steady-state and transient flow to wells; aquifer testing and evaluation of safe yields. Introduction to numerical flow modeling. Prerequisite: GEOL 111G.

- GEOL 475. Geology of Mineral Resources 3 cr. (2+3P)
Introduction to ore deposits and industrial rocks and minerals; genesis, mining methods, estimation of reserves, exploration, and economic aspects of selected commodities. Prerequisite: GEOL 399.
- GEOL 476. Marine Paleogeology 3 cr. (2+3P)
Paleontological and sediment logic analysis of the fossil marine record to reconstruct past ecosystems by interpreting the life habits of past organisms, their association in communities and their relationship to the environments in which they lived.
- GEOL 477. Special Problems 1-3 cr.
Selected advanced topics of current interest or importance. May be repeated for a total of 6 credits. Prerequisite: consent of instructor.
- GEOL 478. Petroleum Geology 3 cr. (2+3P)
Stratigraphy, tectonics, and sedimentation in relation to occurrence of and exploration for hydrocarbons. Prerequisite: GEOL 420.
- GEOL 479. Environmental Soil Chemistry 3 cr.
Same as SOIL 479.
- GEOL 480. Seminar 1-3 cr.
Supervised study of a subject not covered by regular courses. For organized group meetings treating selected advanced topics. Prerequisite: consent of instructor. May be repeated for a maximum of 6 credits.
- GEOL 490. Field Geology 3 cr. (9P)
Mapping, instrumentation, and interpretation of geology in the field. Prerequisites: either GEOL 420 and GEOL 470.
- GEOL 491. Tectonic Evolution of North America 3 cr.
Current ideas regarding the plate-tectonic evolution of North America from Archean through Holocene time, emphasizing the use of regional stratigraphy and structural geology to interpret mountain building, magmatism, and basin development. Prerequisites: GEOL 111G, GEOL 399, GEOL 420 and GEOL 470.
- GEOL 495. Geology Field Camp 4 cr. (12P)
Three week intensive summer course. Geologic mapping in a site-based setting, emphasizing spatial relations, cross-section construction, and preparation of geologic reports. Prerequisite: GEOL 490
- GEOL 499. Senior Thesis 1-3 cr.
Writing a formal paper describing original geologic research conducted under supervision of a faculty advisor. Prerequisite: consent of instructor. Restricted to majors.
- GEOL 501. Geology Colloquium 1 cr.
Presentations by visiting speakers and graduate students.
- GEOL 508. Geology for Educators 3 cr.
Assists K-12 teachers in developing pedagogy and content knowledge in the subject area of geology.
- GEOL 515. Advanced Principles of Geochemical Equilibria 3 cr.
Theory of thermodynamics and the applications of thermodynamics to geological problems. Phase equilibria in water-dominated and magmatic systems.
- GEOL 516. Colorado Plateau Seminar 3 cr.
Geologic history of the Colorado Plateau culminating in a 10-day field trip to choice geologic localities in Arizona and Utah. Prerequisites: GEOL 420 or equivalent.
- GEOL 520. Selected Topics 1-3 cr.
Selected topics in geology. Prerequisites: graduate standing and consent of instructor. May be repeated for unlimited credit.
- GEOL 530. Sandstone Petrology 3 cr. (2+3P)
Provenance and diagenetic history of sand and sandstone as determined by thin-section analysis.
- GEOL 531. Depositional Environments 3 cr. (1+6P)
Interpretation of clastic depositional environments with reference to rock units exposed in southern New Mexico.
- GEOL 532. Carbonate Petrology and Depositional Systems 3 cr. (2+3P)
Textures, composition, diagenesis, and interpretation of carbonate rocks. Laboratory study of rock suites and thin sections illustrating carbonate facies.
- GEOL 533. Petroleum Geophysics 3 cr. (2+3P)
Introduction to fundamentals of exploration seismology, including seismic acquisition, processing, and geologic interpretation of 2-D data sets. Interpretation encompasses major geologic structural styles, including thrust belts, rift basins, and salt provinces.

GEOL 534. Tectonics of Sedimentary Basins	3 cr.
Origin of sedimentary basins with emphasis on subsidence mechanisms, geometry of basin fill and tectonic setting. Lab exercises include field techniques and seismic interpretation. Prerequisites: GEOL 420 or equivalent or consent of instructor.	
GEOL 553. Applied Geomorphology	3 cr. (2+3P)
Same as GEOG 553.	
GEOL 554. Advanced Stratigraphic Concepts	3 cr.
Geometry and origin of strata, emphasizing techniques for correlation and interpretation.	
GEOL 560. Geochemistry of Diagenetic and Hydrochemical Systems	3 cr. (2+3P)
Solution-mineral equilibria and chemical kinetics applied to water-rock interactions, including diagenetic processes in sediments and sedimentary basins.	
GEOL 562. Analytical Geochemistry	3 cr.
Techniques used to determine the major element, trace element and isotopic composition of rocks and minerals and the determination of mineral structure.	
GEOL 565. Isotope Geochemistry	3 cr.
Trace element partitioning and isotope systematics applied to problems in petrology and ore genesis.	
GEOL 567. Global Geochemical Systems	3 cr.
Generation of major element, trace element, and isotopic signatures of igneous rocks in different tectonic settings and propagation or destruction of those signatures by sedimentary and metamorphic processes.	
GEOL 576. Marine Paleoeecology	3 cr. (2+3P)
Paleontological and sediment logic analysis of the fossil marine record to reconstruct past ecosystems by interpreting the life habits of past organisms, their association in communities and their relationship to the environments in which they lived.	
GEOL 578. Petroleum Geology	3 cr. (2+3P)
Stratigraphy, tectonics, and sedimentation in relation to occurrence of and exploration for hydrocarbons. Prerequisite(s): GEOL 420.	
GEOL 580. Tectonic Evolution of the Western U.S.	3 cr.
Geologic history and tectonic evolution of the Western U.S. Cordillera from the Precambrian assembly of the craton to the recent history of rifting in the Rio Grande valley. Focus on the geology of the Southwest, particularly southern New Mexico, but also topics such as evolution of San Andreas fault system.	
GEOL 582. Plate Tectonics	3 cr.
Plate tectonics as a fundamental model for geological activity on a dynamic earth. Focuses on plate tectonic theory development and mechanisms, plus modern analogs of ancient processes.	
GEOL 584. Cenozoic Geology	3 cr.
The Cenozoic geologic history of western North America is examined through lectures, discussion of classic and current literature, and local area field trips. Topics include the Laramide orogeny, ignimbrite flare-up, and Basin and Range/Rio Grande rift crustal extension.	
GEOL 585. Geochronology	3 cr.
The principles, analytical methods, and interpretation of the most common geochronologic methods.	
GEOL 590. Advanced Field Geology	3 cr. (1+6P)
Advanced problems in reconnaissance and detailed mapping and interpretation of rocks in the field.	
GEOL 598. Special Research Programs	1-3 cr.
Investigations into contemporary geological problems. Prerequisites: graduate standing and consent of instructor. May be repeated for unlimited credit.	
GEOL 599. Master's Thesis	0-88 cr.
Thesis research.	

GOVERNMENT

Department site: <http://www.nmsu.edu/~govdept/>
Masters in Public Administration site: <http://www.nmsu.edu/~mpa/>
(575) 646-4935
govdept@nmsu.edu

N. Baker, department head, Ph.D. (Tulane) – public law, American politics, presidency; J. Ackleson, Ph.D. (London School of Economics and Political Science) – International relations, national security, border security; G. Butler, Ph.D. (Catholic) – political theory, American politics; J. Garcia, Ph.D. (New Mexico) – New Mexico politics, border politics, Latin America, comparative politics; N.

Harvey, Ph.D. (Essex) – Mexican politics, comparative politics, Latin America; Y. Lapid, Ph.D. (Columbia) – international relations theory, comparative foreign policy, international organizations; C. Medina (Univ. Colorado Denver) Ph.D. – public administration, public policy, education policy, qualitative methods; D. Prindeville, Ph.D. (New Mexico) – public administration and management, leadership, minority politics, women and politics; W. Taggart, Ph.D. (Florida State) – public administration, public policy, American politics; R. G. Winn, Ph.D., (Arizona State) – public administration, policy analysis, environmental policy

DEGREE: Master of Arts

MAJOR: Government

DEGREE: Master of Public Administration

MINOR: Government

MINOR: Public Administration

MINOR: Security and Intelligence Studies

The Department of Government offers two degrees: the Master of Arts (M.A.) in government and the Master of Public Administration (M.P.A.) and a graduate minor in Security and Intelligence Studies. The programs are designed to prepare students both for diverse careers in the public sector and for further training at the doctoral level. The M.P.A. program is accredited by the National Association of Schools of Public Affairs and Administration (NASPAA), a distinction held by fewer than one-quarter of M.P.A. programs nationwide. The M.P.A. program offers joint degrees with the Department of Criminal Justice (M.P.A./M.C.J.) and with the Department of History (M.P.A./ M.A. in Public History). Students in a joint degree program can earn two master's degrees with fewer credits than would be required to earn those degrees independently.

ADMISSION

Prospective graduate students in either the M. A. or M. P. A. should demonstrate a 3.0 grade point average for the second half of their undergraduate course work. For students with a GPA of less than 3.0, GRE scores are required, though this requirement may be waived if the undergraduate degree was awarded more than five years before applying. Applicants to either program are required to submit an application for program admission (available from the department and on-line), three letters of recommendation, a writing sample, and a personal statement concerning their interest in pursuing a graduate degree. All of these items are to be submitted directly to the department. Additional information concerning program requirements and the admission process can be obtained from either the department's M.A. chair or M.P.A. director. Under exceptional circumstances the department may exempt students from the minimal requirements. Application for admission to the Graduate School should clearly indicate the program in which the student wishes to enroll.

Students interested in a joint degree option must apply and be accepted in to the two departments separately, and indicate their interest on their applications in one of the joint degree programs.

GENERAL REQUIREMENTS

Students in both the M.A. and M.P.A. programs select either a thesis or nonthesis option. Students planning on continuing their studies in a doctoral program or wishing to establish expertise related to a specific career objective are strongly encouraged to select the thesis option. The nonthesis option is suggested for students desiring immediate employment or seeking to enhance their current employment situations. Course work outside the department must have prior advisor approval to ensure a well-integrated program of study. Complete information on the requirements for either program should be obtained directly from the department. Most M.A. and M.P.A. courses are offered in the evening.

DEGREE: Master of Arts

MAJOR: Government

The M.A. program provides general course work in each of the major fields of political science. Students may choose either the thesis option, under which they complete 30 credits of course work plus 6 thesis credits (GOVT 599), or the nonthesis option, with 30 credits of course work plus 6 hours of special research credit (GOVT 598) or 6 hours of approved internship credit (GOVT 510). Both the thesis and nonthesis options require a final oral examination; the non thesis option requires a written examination as well. The program provides a broad-

based foundation in political science while allowing students to pursue specific areas of interest. All students are required to complete a research methods class, either GOVT 502 or GOVT 503. In addition, students must take 3 of the following 6 courses (9 credits):

- GOVT 530, Seminar in Public Policy
- GOVT 550, Seminar in American Politics
- GOVT 560, Seminar in International Relations Theory
- GOVT 570, Seminar in Comparative Politics
- GOVT 580, Seminar in Political Theory
- GOVT 590, Seminar in Public Law and Legal Systems

The remaining credits required for the degree are selected subject to advisor approval to satisfy particular academic interests or career goals. Flexibility in planning a program of study is permitted to meet the educational needs of a diverse student population. Structured areas of emphasis are available in several topical areas including security studies, Latin American affairs, and international affairs. The study program for each certification area must be approved by the M.A. Program Committee. Information on these areas may be obtained from the Department of Government. No more than 9 credits taken outside the department will be counted toward the degree.

DEGREE: Master of Public Administration

The M.P.A. program is accredited by NASPAA. The M.P.A. is designed to provide students with the managerial and analytical skills, in addition to ethical and professional values, necessary to meet the increased demand for skilled public administrators. Candidates who follow this professional program must complete a minimum of 42 credits, consisting of core courses, electives and either an internship or a thesis. All students are required to complete a core curriculum of 18 credits, including:

- GOVT 502, Research Methods in Government
- GOVT 541, Public Budgeting
- GOVT 542, Public Sector Human Resource Management
- GOVT 544, Public Policy Analysis
- GOVT 547, Government Organizations (Organizational Theory)
- GOVT 549, Ethics in Government

The remaining 24 credits required for the degree are selected with the approval of an advisor to meet the needs and interests of the individual candidate. Because students have divergent career goals, a thesis or internship option is offered. The thesis option requires an additional 18 credits of course work, 6 credits of thesis (GOVT 599), and an oral examination covering the thesis and course work. The internship option requires an additional 21 credits of course work, 3 credits of internship (GOVT 510), and an oral examination covering the internship and course work. As part of the course work, students selecting the internship option must take GOVT 519 (Proseminar/Capstone in Public Administration) during the latter part of their studies, and are required to earn a B- grade or higher in that course.

With approval, students may include up to 12 credits of relevant course work from other departments to be counted toward the total credits required for the M.P.A. These credits may be selected to form a graduate minor in another academic discipline.

Candidates with inadequate preparation for graduate study in public administration may be required to take appropriate undergraduate and graduate courses as part of, or in addition to, a regular program of study. Applicants to the M.P.A. program will be advised of any such requirements at the time of admission.

JOINT M.P.A.-M.C.J. PROGRAM

The M.P.A.-M.C.J. joint degree option requires completion of a minimum of 57 credits of approved course work from the Departments of Government and Criminal Justice. Students interested in this option should meet with the M.P.A. director or criminal justice graduate advisor for additional information.

JOINT M.P.A.- M.A. PUBLIC HISTORY PROGRAM

The M. P. A.- M. A. Public History degree option requires completion of a minimum of 57 credits of approved course work from the Departments of Government and History, including completing internship credits in both programs. Interested applicants should consult with the M. P. A. director or the director of the Public History Program for additional information.

MINOR: Security and Intelligence Studies

Course Requirements: Nine semester hours of graduate course credit from the following courses:

- GOVT 461 International Political Economy
- GOVT 468 Rebels, Guerrillas, and Terrorists in Modern Latin America
- GOVT 549 Ethics in Government
- GOVT 560 Seminar in International Relations Theory
- GOVT 562 Advanced Issues in Security and Intelligence Studies
- GOVT 564 Advanced National Security Policy
- GOVT 566 Advanced Issues in American Foreign Policy
- GOVT 567 Terrorism and Political Violence
- GOVT 568 Advanced Intelligence Studies
- GOVT 569 Advanced Issues in Globalization
- GOVT 574 Contemporary Comparative Studies
- GOVT 596 International Law

Additional Courses: Other graduate courses may become available during the year which may be substituted for the above listed courses. Consideration may be made on a case-by-case basis.

GOVERNMENT

- GOVT 465. Peru: From Incas to Inca Kola 3 cr.
Explores issues of cultural and national identity in Peru from the Incas to the present, focusing on the modern period. Themes include indigenous resistance and adaptation to colonial rule, nationalism, militarism, terrorism, globalization, and the drug trade. Same as ANTH 459 and HIST 459.
- GOVT 468. Rebels, Guerrillas, and Terrorists in Modern Latin America 3 cr.
Explores history of rebels in Latin America. Examines guerilla struggles attaining national dimension. Focus on modern events, including Peru's Shining Path, Columbia's FARC, and Mexico's Zapatistas. Same as HIST 331.
- GOVT 469. Globalization 3 cr.
Analysis of the globalization process. Covers theories of globalization, the global economy, political globalization, global culture, transnational social movements, transnational migration and world labor market, global cities, and local-global linkages. Same as SOC 489.
- GOVT 473. Germany 3 cr.
Political, social, and cultural developments from the eighteenth century to the present, with emphasis on the Nazi era. Same as HIST 383.
- GOVT 474. European Politics 3 cr.
Politics in European countries, European integration, post-communist states, regionalism and border politics.
- GOVT 476. Modern Eastern Europe 3 cr.
Addresses the diversity of Eastern European political and cultural experiences from the end of the 19th century to the present day. Same as HIST 380.
- GOVT 493. Mass Communications Law 3 cr.
Same as JOUR 493 and COMM 493.
- GOVT 501. Scholarly and Professional Writing 1 cr.
Research, writing and editing skills for advanced academic and professional communication in disciplinary contexts.
- GOVT 502. Research Methods in Government 3 cr.
Contemporary methods of political analysis, including mathematical and statistical techniques and computer applications.
- GOVT 503. Qualitative Research Methods 3 cr.
An overview of qualitative research methods such as fieldwork, ethnography, content analysis, case studies, focus groups and grounded theory. Introduces students to epistemology - the study of knowledge - and to basic components of research design. Explores activist scholarship, ethical dilemmas in research, and software tools for computer assisted analysis. Especially useful for students preparing theses, dissertation, or other research projects.
- GOVT 505. Directed Readings 1-3 cr.
Selected topics in government. May be repeated for a total of 6 credits. Graded S/U. Prerequisite: consent of instructor.
- GOVT 510. Internship 1-6 cr.
Assignment with a public agency and research report. Only 3 credits apply toward degree requirements. Graded S/U. Prerequisite: approval of graduate advisor.
- GOVT 517. Selected Topics in Government 3 cr.
Selected issues which may cross sub-fields of the discipline. May be repeated for a total of 6 credits.
- GOVT 519. Proseminar in Public Administration 3 cr.
Review of classic and contemporary theory and practice in public adminis-

<p>tration. Application of written and oral skills to the presentation and defense of essays on various aspects of public administration. Prerequisite: 30 credits of M.P.A. program course work, including at least five of the core M.P.A. courses.</p>		
GOVT 522. Public Sector Economics I	3 cr.	Same as AEEC 522.
GOVT 523. Public Sector Economics II	3 cr.	Same as AEEC 523.
GOVT 524. American Indian Politics	3 cr.	Introduction to American Indian tribal governments, politics, policy, and administration; historical and contemporary leadership of Indian Nations; and the history and current status of American Indian-U.S. relations. Students learn about Native peoples' cultural responses, forms of resistance, and adaptations to colonization.
GOVT 526. Women, Politics and Administration	3 cr.	Examination of women's participation in U.S. electoral politics as voters, candidates, and officeholders; their political activism in issue-based movements and strategies for affecting public policy; leadership as administrators and managers in public service agencies. Course also covers the influence of feminism in changing women's roles socially, legally, and politically.
GOVT 527. Issues in Public Management	3 cr.	Selected issues in public management. May be repeated under different subtitles for a total of 6 credits.
GOVT 528. Public-Private Partnerships	3 cr.	This course explores how taxpayer-funded services are administered and delivered through public-private partnerships involving privatization and government contracting with the nonprofit sector and for-profit companies. The class will explore funding, legal, accountability, and stakeholder issues in partnerships in health and human services, criminal justice, and homeland security.
GOVT 530. Seminar in Public Policy	3 cr.	Survey of the political, administrative, and technical aspects of policy making in government. Crosslisted with: AEEC 580
GOVT 531. Public Program Evaluation	3 cr.	Politics, processes, and techniques for evaluating both program operations and the outcome of program endeavors.
GOVT 535. Education Policy and Politics	3 cr.	Overview of current pressing policy issues and political debates on education in the U.S., including school choice, vouchers, accountability, and affirmative action. Multiple topics and perspectives covered, with political economy the main approach.
GOVT 537. Issues in Public Policy	3 cr.	Selected issues in public policy. May be repeated under a different subtitle for a total of 6 credits.
GOVT 540. Seminar in Public Administration	3 cr.	Survey course on the theory and practice of program, personnel, and financial management in government and the private, nonprofit sector.
GOVT 541. Public Budgeting	3 cr.	Budgetary processes; budget classification, analysis, and evaluation.
GOVT 542. Public Sector Human Resources Management	3 cr.	Exploration of public personnel systems and practices; including job analysis, compensation, performance evaluation, recruitment, and labor-management relations.
GOVT 543. Skills Workshop	1-6 cr.	Focus on management of task skills in selected areas of public administration. Specific topics will appear in the Schedule of Classes; may be repeated for a total of 6 credits.
GOVT 544. Public Policy Analysis	3 cr.	Environment of policy analysis; various descriptive and quantitative designs for analyzing and evaluating public policy. Problems of policy analysis. Prerequisite: GOVT 502 or consent of instructor.
GOVT 547. Government Organizations	3 cr.	Historical overview and present applications of organization theory in public management.
GOVT 548. Public Sector Leadership	3 cr.	Theories and styles of leadership.
GOVT 549. Ethics in Government	3 cr.	Examination of standards, perspectives, and issues for ethical decision-making in public agencies.
GOVT 550. Seminar in American Politics	3 cr.	Overview of American political institutions. Includes study of American constitutional theory; legislative, executive, and judicial functions and processes; political parties and interest groups; and public policy formulation.
GOVT 553. Issues in American Politics	3 cr.	Selected issues in American Politics. May be repeated under a different subtitle for a total of 6 credits.
GOVT 560. Seminar in International Relations Theory	3 cr.	A critical overview of leading approaches and controversies in international relations theory. The purpose of the course is to introduce students to contending theoretical perspectives and conceptual frameworks that help make sense of contemporary world politics.
GOVT 562. Advanced Issues in Security and Intelligence Studies	3 cr.	Selective issues in comparative security and intelligence studies.
GOVT 563. Issues in International Relations	3 cr.	Selected issues in international relations. May be repeated under a different subtitle for a total of 6 credits.
GOVT 564. Advanced National Security Policy	3 cr.	Major topical, theoretical, and regional issues in national security policy.
GOVT 566. Advanced Issues in American Foreign Policy	3 cr.	Major topical, theoretical, and regional issues in American foreign policy. May be repeated for a maximum of 6 credits under different subtitles.
GOVT 567. Terrorism and Political Violence	3 cr.	An advanced graduate course using an interdisciplinary framework to explore definitions, historical roots, contemporary manifestations and future trends in political terrorism. The course seeks to understand modern-day terrorism as a form of political violence.
GOVT 568. Advanced Intelligence Studies	3 cr.	Advanced survey of major theoretical approaches and substantive issues in intelligence studies.
GOVT 569. Advanced Issues in Globalization	3 cr.	Analysis of the globalization process. Covers theories of globalization; global economy; political globalization; global culture; transnational social movements; transnational migration and world labor market; global cities; local-global linkages. Same as SOC 589.
GOVT 570. Seminar in Comparative Politics	3 cr.	Examination of methods used for comparing various types of political entities. Investigation of criteria needed to examine a concept across cultures or national boundaries.
GOVT 571. Seminar in Latin American Politics	3 cr.	Overview of the political structures of the Latin American region. Addresses a number of contemporary issues facing Latin American states, including interest groups, the church, labor, political parties, U.S.-Latin American relations, political development.
GOVT 573. Resistance Movements in World Politics	3 cr.	Advanced research on violent and non-violent resistance movements around the world. Focus on origins, demands, ideologies, strategies and impacts in the post-Cold War context of economic globalization, US military power and new geopolitical dynamics.
GOVT 574. Contemporary Comparative Studies	3 cr.	Major topical, theoretical, and regional issues in international politics. May be repeated once.
GOVT 575. Issues in Comparative Politics	3 cr.	Selected issues in comparative politics. May be repeated under a different subtitle for a total of 6 credits.
GOVT 578. Seminar in the U.S.-Mexican Border	3 cr.	An analysis of the political environment along the United States-Mexico border and a survey of the literature available for a number of contemporary issues.
GOVT 579. Seminar in Mexican Politics	3 cr.	Advanced research on politics and government of Mexico.
GOVT 580. Seminar in Political Theory	3 cr.	Examination of major issues in political theory, including democracy, sovereignty, classical and modern traditions of thought. May be repeated with different subject matter.
GOVT 582. Study of Political Theory	3 cr.	Examination of methods of interpretation and analysis of political theory, including Straussian, structuralist, historical, and other approaches to the study of political theory.
GOVT 587. Seminar in Religion and Politics	3 cr.	Historical, theoretical and comparative analyses of the interaction between politics and religion.
GOVT 590. Seminar Public Law and Legal Systems	3 cr.	Focus on U.S. Constitutional Law and other national legal systems.
GOVT 591. Law for Administrators	3 cr.	Case-law definitions of the legal roles and powers of public administrators.
GOVT 593. Issues in Public Law	3 cr.	Selected issues in public law. May be repeated under a different subtitle for

a total of 6 credits.		
GOVT 594. Ethical and Legal Dilemmas in Security Studies	3 cr.	
Examination of major ethical and legal dilemmas in the pursuit of security in the age of terror.		
GOVT 596. International Law	3 cr.	
Nature, growth and scope of law of nations; rights and obligations of states in peace and war; current issues.		
GOVT 597. International Organizations	3 cr.	
Evolution and significance of major functional, political, and economic global and regional international organizations.		
GOVT 598. Special Research Programs	1-3 cr.	
Individual investigations either theoretical, analytical or experimental. Three credits may be taken per semester for a total of 6 credits for thesis students, and 9 credits for non-thesis students. Consent of instructor required.		
GOVT 599. Master's Thesis	0-88 cr.	
Thesis.		

HISTORY

Department website <http://www.nmsu.edu/~histdept/>
Program in Public History site <http://web.nmsu.edu/~publhist/>
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J. Hunner, department head, Ph.D. (New Mexico)- public history, New Mexico; J. L. Bronstein, Ph.D. (Stanford)-nineteenth century U.S., Britain; N. M. Brooks, Ph.D. (Columbia)-Russia/Soviet Union, modern Europe, modern science; J.P. Brown, Ph.D., (Illinois-Urbana)-early United States, public history; W. C. Eamon, Ph.D. (Kansas)-history of science, early modern Europe; I. Garcia-Bryce, Ph.D. (Stanford)- Latin America, Peru; K. J. Hammond, Ph.D. (Harvard)-China, East Asia; E. Horodowich, Ph.D. (Michigan-Ann Arbor)-early modern Europe, Mediterranean; M. Malamud, Ph.D. (California-Berkeley)-ancient, medieval, Islam; A. Orzoff, Ph.D. (Stanford)-twentieth-century Europe, Eastern Europe, intellectual history; D. T. Pitcaithley, Ph.D. (Texas Tech)-historical memory, public history, Civil War.

DEGREE: Master of Arts

MAJOR: History

CONCENTRATION: Public History

MINOR: History

The Department of History offers graduate work leading to the Master of Arts degree. In addition to fulfilling the basic requirements for admission to the Graduate School, applicants must present undergraduate passage of at least 12 credits in history with grades of B or higher, including 6 upper division history credits. Those lacking this preparation must normally make up deficiencies before beginning graduate course work. Candidates who choose a course of study requiring a foreign language will be responsible for their own language preparation.

Students applying for admission to the graduate program in history are required to submit an application form and a transcript to the Graduate School and a strong writing sample, three letters of recommendation ideally from History faculty members at NMSU or other institutions, and a two-to-three page statement of purpose to the Department of History, approximately four months in advance of the desired enrollment date. Applicants for graduate assistantships and fellowships must submit a letter of application, a transcript, and three letters of recommendation to the department by February 15 for the fall semester, and by October 15 for the spring semester. Students who are not applying for graduate assistantships and fellowships may apply at any time for acceptance into the graduate program.

Thirty-six credits (27 of which must be at the 500 level) are required for the thesis program, including at least 3 public history credits above the 500 level; four history graduate seminars that include the Craft of History seminar, two readings seminars from among History 590, 591, 592, and 593, and a research seminar; and a thesis (6 credits). With permission of the graduate advisor, a maximum of 6 credits may be taken in related fields outside the Department of History. A student choosing the thesis program must receive permission for his/her thesis by passing a thesis proposal defense after earning 12 graduate credits in History. The department will provide guidelines for the thesis defense. A student choos-

ing the thesis program must pass a final oral examination over graduate course work and the thesis.

Thirty-six credits (27 of which must be at the 500 level) are required for the Public History specialization. These include four history seminars: the public history seminar, Craft of History, one research seminar, and one readings seminar from among History 590, 591, 592, and 593. Students complete a public history internship (3 credits) and preparation of an article of scholarly quality (3 credits).

Students in the Public History specialization must collectively pass 18 credits of nonpublic history courses, including the nonpublic history seminars noted above. They must collectively pass 18 credits in public history, which must include the public history seminar, the internship, and the article. The scholarly article is developed through work in the internship and will be of peer reviewed journal quality. The public history credits may include a maximum of 9 graduate level (450 -and-above) credits outside the Department of History with permission of the Director of the Public History Program. A student choosing the Public History specialization must pass an article proposal defense about the proposed scholarly article during the first semester after completion of the internship. The department will provide guidelines for the article defense. A student choosing the Public History specialization must give a public presentation of a portfolio that includes his/her work and the scholarly article, and must pass an oral examination over graduate course work, the internship, and the article. Students who receive a Master's degree in this track will have a specialization in Public History added to their transcripts.

Students choosing to pursue both the thesis track and Public History specialization must complete the course hours required for the public history specialization, perform an internship, and defend the proposed thesis before undertaking it using guidelines provided by the department, present the public history portfolio at a public presentation, complete the thesis, and defend their course work, thesis and public history portfolio at a final oral examination. In order to satisfactorily complete both programs, such students would complete 39 credits, including three hours of internship credit and six hours of thesis work.

The Department of History and the Department of Government offer a joint degree in which students who are accepted into both of these programs may simultaneously earn both a Master of Arts in History degree with the Public History specialization, and a Master of Public Administration degree. The joint degree requires 57 total credits, while students who pursued both degrees as separate degrees would need to pass at least 72 credits. Students earning the joint degrees must pass a joint oral examination after passing required courses and completing internship credits in both programs. Students interested in the joint degree program should consult with the Director of the Public History Program and the Director of the Master of Public Administration Program.

Students may earn a graduate minor in History by passing the following courses: Craft of History, one readings seminar from among History 590, 591, 592, and 593, and two additional 3-credit 500-and-above courses, for a total of 12 graduate credits.

Graduate students in History must maintain a 3.0 grade point average in their History courses. A graduate student earning a C or lower grade in one History course will receive a letter of warning. A graduate student earning two or more C or lower grades in History courses or whose History grade point average falls below 3.0 will be removed from the History graduate program. Students must earn at least one B or higher grade in a seminar during their first year in the graduate program, and must take at least one seminar during each year in which they are enrolled in the program. If a graduate student receives one U (Unsatisfactory) grade on his/her thesis or internship, the student will receive a written warning, and if a student received two or more U grades on his/her thesis or internship, the student will be removed from the program.

HISTORY

HIST 453. Cuba: Colony to Castro	3 cr.
Economic, social, and political development of Cuba and other colonies and nations in the Caribbean with emphasis on recent events.	
HIST 455. Brazil	3 cr.
Economic, social, and political development of Brazil since independence. The influence of Brazil in the international arena.	
HIST 459. Peru: From Incas to Inca Kola	3 cr.
Explores issues of cultural and national identity in Peru from the Incas to the present, focusing on the modern period. Themes include indigenous resistance and adaptation to colonial rule, nationalism, militarism, terrorism, globalization, and the drug trade. Same as ANTH 459 and GOVT 465.	
HIST 471. China through the Ming Dynasty	3 cr.
History of China from origins to Ming dynasty, (1368-1644). Cultural and	

- political development with emphasis on social and economic contexts and long term trends.
- HIST 472. China in the Modern World 3 cr.
History of China from seventeenth through twentieth centuries. Rise and fall of the Manchu Qing dynasty, internal dynamics of social and political change in nineteenth and twentieth centuries, impact of Western Imperialism, and development of the Peoples Republic since 1949.
- HIST 473. History of Japan 3 cr.
History of Japan through twentieth century. Political and cultural developments and their social and economic contexts. Chinese influence on early Japan, rise of Samurai and Shogunate, impact of Western Imperialism, and emergence of modern Japan.
- HIST 474. Gender in East Asian History 3 cr.
Examines the position of women and the social roles of both sexes in traditional China and Japan, and traces the changes taking place in those societies in the course of modernization in the last century and a half. Scholarly literature and works of Chinese and Japanese literature in translation and cinema used. Same as WS 474.
- HIST 475. History of the Global Political Economy 3 cr.
Traces development of global systems of economic interaction and the rise of European military and political dominance in the 18th and 19th centuries. Emphasis on East and South Asian roles in early modern history, and on challenges to European dominance in the 20th and 21st centuries.
- HIST 479. Oral History 3 cr.
Oral history through readings, discussions, and interviews. Semester project required that includes an interview and transcript.
- HIST 481. Time Traveling Through New Mexico's Past 3 cr.
Teaches historians and educators how to make history come alive. Semester project includes role playing characters and activities from a past era with local schools and museums.
- HIST 483. Historic Preservation 3 cr.
Study of community development, the historic preservation movement, and the built environment. Field project.
- HIST 484. Historical Editing, Theory and Practice 3 cr.
Readings in historical editing. Projects in editing at the university archives. Includes editing papers and helping to produce a scholarly journal.
- HIST 486. Interpreting Historic Places for the Public 3 cr.
Explores historic site interpretation, the scholarship and philosophy of historic interpretation, and the nature of heritage interpretation for historic places.
- HIST 489. Projects in History 3 cr.
Individual projects in history. Prerequisite: consent of instructor. May be repeated for a maximum of 6 credits.
- HIST 500. Special Topics 1-9 cr.
Specific subjects to be announced in the Schedule of Classes. Graduate research paper required. May be repeated for a maximum of 12 credits.
- HIST 501. Colonial America 3 cr.
Social, economic, environmental, and political dimensions of European settlement of North America. Research paper required.
- HIST 502. Revolutionary America, 1763-1800 3 cr.
Development and consequences of the American Revolution, Articles of Confederation, Constitution, and Federalist period. Graduate research paper required.
- HIST 503. The Jacksonian Era, 1800-1840 3 cr.
Jeffersonian period, War of 1812. Social, political, and economic history of the Jacksonian era. Graduate research paper required.
- HIST 504. Civil War Era, 1840-1877 3 cr.
Mexican-American War, development of secession, American Civil War, Reconstruction. Graduate research paper required.
- HIST 505. Progressive United States, 1877-1920 3 cr.
Gilded Age through end of World War I. Emphasis on Populist movement, progressive reform, the impacts of industrialization, imperialist expansion, and World War I.
- HIST 506. The New Deal, 1920-1960 3 cr.
Roaring Twenties through Eisenhower presidency. Emphasis on the Great Depression, Roosevelt's New Deal, World War II, origins of the Cold War, and impact of the postwar baby boom. Research paper required.
- HIST 508. Environmental History 3 cr.
Seminar discusses how the natural environment and people have shaped each other, and how people have perceived and imagined the natural world. May focus upon one specific topic or area. Course includes a field trip outside regular class times.
- HIST 509. Native American History 3 cr.
Seminar explores the history of Native Americans, including tribal conflicts, interactions with Europeans, and Euro-Americans, land loss, degradation of natural resources, federal Indian policy, pan-Indian movements, cultural resistance and revitalization, and modern tribal economies.
- HIST 510. New Mexico History for Educators 3 cr.
Course provides advanced content and innovative techniques for teachers of New Mexico history. Covers pre-contact Native American history through Spanish Colonial and Mexican periods through the twentieth century.
- HIST 511. Making the American West 3 cr.
Development of the American West from 1803 to 1900, with emphasis on conquest, federal and corporate roles in western development, environmental change, and the mythic West. Includes extra class meetings to view feature-length films. Graduate research paper required.
- HIST 514. American Social and Cultural History since 1900 3 cr.
Social and cultural change in the United States during the 20th century. Research paper required.
- HIST 516. History of Latinos in the United States 3 cr.
Development of Latino communities since 1500 in what is today the United States. Emphasis on 1846 to present, and on Mexican Americans, Puerto Ricans, and Cuban Americans. Major themes: race, colonialism, immigration, nationalism, class, culture, gender, and politics. Graduate research paper required.
- HIST 518. From the Wild West to the Atomic West 3 cr.
Explores the transformation of the West, with particular attention to the roles of race, class, gender, and culture. Includes extra class meetings to view feature-length films. Graduate research paper required.
- HIST 520. History of Women and Gender 3 cr.
Seminar discusses the position of women and the roles of both sexes in specific historical and geographic setting. Course emphasizes the ways in which women and gender were both central to and fundamentally affected by all political and social transformations in history.
- HIST 521. U. S. Foreign Relations to 1919 3 cr.
Foreign relations from colonial origins through World War I. Emphasis on diplomacy of the Founding Fathers, the continental expansion, and the United States rise to world power.
- HIST 522. U. S. Foreign Relations since 1919 3 cr.
Foreign relations from the conclusion of World War I to the present. Emphasis on isolationism, World War II, Soviet-American relations, Vietnam, and new challenges in a multipolar world.
- HIST 523. History of U.S. Intelligence 3 cr.
History of U.S. intelligence from George Washington followed by the origins of Army/Navy intelligence a century ago. Emphasis on 20th century U.S. espionage/counter-intelligence agencies including role of the FBI, code breaking NSA/CSS, American spy satellites and the role of the CIA. Research paper required.
- HIST 524. Art, Thought and Literature 3 cr.
Seminar discusses a variety of artistic and literary expressions in their historical contexts and focuses on the ways in which cultural forms both reflect and construct the broader historical trends that surround them.
- HIST 525. History of Magic and Witchcraft in Medieval and Renaissance Europe 3 cr.
Examines history of popular and scientific beliefs about magic and witchcraft in medieval and early modern Europe. Includes origins of occult Western sciences; Arabic sources of medieval magic; the occult sciences in scholasticism; witchcraft and scholasticism; witchcraft and medieval theology, witch hunts of the 16th and 17th centuries; and the decline of belief in magic and witchcraft. Emphasis on boundaries that defined and separated magic, science, and religion in Western thought from late antiquity through the Scientific Revolution. Prerequisite: HIST 101G.
- HIST 526. Social and Cultural History 3 cr.
Seminar discussions focus on methodological approaches to social and cultural history in specific historical and geographical contexts. Includes such themes as historical demography, family structure, class formation, community and popular culture.
- HIST 527. Labor History 3 cr.
Seminar discussions explore labor and working-class history, including such topics as pre-industrial labor, slavery, debt peonage, indentured servitude, and housework. May explore the history of labor organization, working-class culture and leisure activities, and responses to labor issues by the state.
- HIST 528. History of Terrorism in Modern Europe and the Middle East 3 cr.
Advanced analyses of causes, methods, and consequences of terrorism in Europe and the Middle East from the Reign of Terror in the French Revolution to Al-Qaeda, Hamas, and Hezbollah in the contemporary Middle East and beyond.

- HIST 529. Plague, Plunder, and Preservation: American Environmental History** 3 cr.
Explores how the natural environment influenced human actions, decisions, and cultural and social development from the colonial period to the present; how people reshaped and reordered the natural environment; and how people perceived or imagined the natural world. Graduate research paper required.
- HIST 530. Antiquity and Modernity** 3 cr.
Seminar explores link between earlier and more recent historical periods. Examples may include the Renaissance rediscovery of ancient Rome or the early Chinese reassessment of its classical Confucian heritage. Readings include ancient sources and the modern reception of such works, and the scholarly assessment of these processes. Individual research projects required in areas of student interests.
- HIST 531. The Scientific Revolution** 3 cr.
Seminar discussions explore scientific thought and practice and technological change in specific historical contexts. Focus will be on the impact of science and technology on society, the development of scientific institutions, and the political and cultural context of science and technology.
- HIST 535. War and Revolution** 3 cr.
Seminar covers historical dynamics of violent social, political and economic transitions. May focus upon a particular war or upheaval, such as World War II or the French Revolution, or may examine more generic characteristics of conflict and radical change across many historical examples. Extensive readings in scholarly literature. Research projects relating to specific course contents.
- HIST 536. Nations and Nationalism** 3 cr.
Seminar examines major theories of nationalism from the nineteenth to the twenty-first centuries. Course includes nationalist case studies, from liberal nationalist state-building to ethnic cleansing in the Balkans.
- HIST 537. Empire and Colonialism** 3 cr.
Seminar covers the rise and fall of imperial and colonial systems. May examine the history of the British Empire, the rise of Russian and Chinese imperial orders in Central Asia, Spanish colonies in the New World, or other specific case studies, or may consider comparative patterns and narratives of imperial, colonial and post-colonial experiences. Readings include primary and secondary sources. Individual research projects required.
- HIST 538. Special Topics in European History** 3 cr.
Advanced special topics in European history to be announced in the schedule of classes. May be repeated for a maximum of 12 credits.
- HIST 539. Twentieth Century Science** 3 cr.
The development of science after 1900. Emphasis will be placed on the "second scientific revolution" in physics and on the emergence of genetics and molecular biology.
- HIST 540. Special Topics in Middle Eastern History** 3 cr.
Advanced special topics in Middle Eastern history to be announced in the Schedule of Classes. May be repeated for a maximum of 12 credits.
- HIST 541. Intellectual History of Modern Europe** 3 cr.
Culture and ideas in Europe from 1600 to the present, from the Scientific Revolution to Postmodernism, including ideas and their expression in science, art, literature, and politics. Graduate research paper required.
- HIST 542. Art and Life in Renaissance Italy** 3 cr.
Examines how Italian Renaissance textual and visual culture offered Europe new ways of seeing and portraying itself, 1350-1550. Topics include: Florence, Venice, Rome, Leonardo, Michelangelo, Titian, humanism, the Medici, and republican and courtly culture. Same as ART 542.
- HIST 543. Special Topics in Asian History** 3 cr.
Advanced special topics in Asian history to be announced in the Schedule of Classes. May be repeated for a maximum of 12 credits.
- HIST 544. Special Topics in Latin American History** 3 cr.
Advanced special topics in Latin American history to be announced in the Schedule of Classes. May be repeated for a maximum of 12 credits.
- HIST 545. Special Topics in United States History** 3 cr.
Advanced special topics in United States history to be announced in the Schedule of Classes. May be repeated for a maximum of 12 credits.
- HIST 546. World War I** 3 cr.
Cultural, social, and intellectual background and impact of World War I. Military and diplomatic events of the war. Consequences of the war. Graduate research paper required.
- HIST 547. World War II** 3 cr.
Social, cultural and political aspects of World War II, in addition to traditional military events. Emphasis on U.S. involvement. Graduate research paper required.
- HIST 548. Nuclear Nation** 3 cr.
Explores post-World War II history and the impact that atomic energy has had on the United States and the world.
- HIST 549. Graduate Readings** 1-3 cr.
Individual study of selected readings and problems. Prerequisite: consent of instructor. May be repeated for a maximum of 6 credits.
- HIST 550. Latin America and the United States: Uneasy Neighbors** 3 cr.
Covers U.S.-Latin American relations during the nineteenth and twentieth centuries. Assesses interactions between the United States and other nations in the Americas, surveys U.S. interventions in the region, and appraises social challenges facing the Americas as a whole.
- HIST 551. Colonial Mexico** 3 cr.
Political, economic, and social development from the Aztecs to 1821. Graduate research paper required.
- HIST 552. Modern Mexico** 3 cr.
From independence to the present, with emphasis on the Revolution. Graduate research paper required.
- HIST 553. Cuba: Colony to Castro** 3 cr.
Economic, social, and political development of Cuba and other colonies and nations in the Caribbean, with emphasis on recent events. Graduate research paper required.
- HIST 555. Brazil** 3 cr.
Economic, social, and political development of Brazil since independence. The influence of Brazil in the international arena. Graduate research paper required.
- HIST 557. The Mexican Revolution** 3 cr.
Origins, causes, and scope of the Mexican Revolution, including leading personalities, with emphasis on the U.S.-Mexican border. Graduate research paper required.
- HIST 559. Peru: From Incas to Inca Kola** 3 cr.
Crosslisted with: ANTH 559 and GOVT 565
- HIST 560. History of Egypt** 3 cr.
Advanced study of history of Egypt from ancient through modern times. Includes the study of Egypt's interactions with the Middle East and the West, as well as its legacy for both civilizations.
- HIST 561. Islam and the West: Cultural Contacts, Conflicts and Exchanges** 3 cr.
Examines interactions, encounters and cross-fertilization between the Islamic world and the West from the seventh to the twenty-first centuries. Course includes origins of Islam, relationships between Islam, Judaism, and Christianity, and concludes with the post 9/11 present. Prerequisites: C or higher grade in HIST 221G or HIST 222 or HIST 461; or enrollment in one of these courses at the same time as enrollment in HIST 561.
- HIST 563. Nineteenth Century Europe** 3 cr.
Rise of Europe to a position of economic and political dominance in the world from the French Revolution to World War I.
- HIST 564. Twentieth Century Europe** 3 cr.
Course will address the foremost events, personalities, developments and ideas which marked the European continent during the twentieth century.
- HIST 565. Cold War Europe** 3 cr.
Course deals with the Cold War's multipolar international climate as well as the individual paths charted by each European nation in response. Events, leaders, thinkers, ideas and developments will all be featured. Crosslisted with: GOVT 565
- HIST 566. British Imperialism** 3 cr.
Survey of the activities of the British empire from the 16th century through the 20th century, with emphasis on Ireland, North America and India. Assesses the impact of imperial activities on British domestic politics, culture and social history, and the process and impact of decolonization.
- HIST 567. Race and Ethnicity** 3 cr.
Seminar explores the historical social construction of race and ethnicity, and their relationship to other systems of social difference such as class and gender. Course will examine popular and academic theories of race and ethnicity as well as historical concrete effects of racial and ethnic differences in society.
- HIST 568. Urban History** 3 cr.
Seminar discusses cities as complex catalysts for cultural, political, and scientific development, both within cities themselves and more broadly for their nations and regions. Course deals with such topics as the relationship between social organization and physical space; city development, morphology and dynamics; and the cultural and intellectual history of cities.
- HIST 569. History of Religion and Spirituality** 3 cr.
Seminar examines religion and spirituality in a variety of historical settings. Includes formal religious institutions, popular religion, and heterodoxy. Introduces students to competing theories of religion.
- HIST 570. The Cold War in Latin America** 3 cr.
Seminar discusses Latin American political history during the Cold War. Course focuses on how Latin Americans (individuals, parties, militaries, states) acted in an increasingly politicized arena defined by growing United

- States concerns over Cuban and Soviet influence in the area.
- HIST 571. China through the Ming Dynasty 3 cr.
History of China from origins to Ming Dynasty, 1368-1644. Cultural and political development with emphasis on social and economic contexts and long term trends. Research paper required.
- HIST 572. China in the Modern World 3 cr.
Covers the history of China from 17th through 20th centuries. Rise and fall of the Manchu Qing dynasty, internal dynamics of social and political change in the 19th and 20th centuries, impact of Western imperialism, and development of the Peoples Republic since 1949. Research paper required.
- HIST 573. History of Japan 3 cr.
Covers the history of Japan through the 20th century. Political and cultural developments and their social and economic contexts. Chinese influence on early Japan, rise of Samurai and Shogunate, impact of Western imperialism, and the emergence of modern Japan. Research paper required.
- HIST 574. Gender in East Asian History 3 cr. (3+2P)
Examines the position of women and the social roles of both sexes in traditional China and Japan, and traces the changes taking place in those societies in the course of modernization in the last century and a half. Scholarly literature and works of Chinese and Japanese literature (in translation) and cinema used. Same as W S 574.
- HIST 575. History of the Global Political Economy 3 cr.
Traces development of global systems of economic interaction and the rise of European dominance in the 18th and 19th centuries. Emphasis on East and South Asian roles in early modern history, and on challenges to European dominance in the 20th and 21st centuries.
- HIST 576. The Holocaust 3 cr.
Advanced study of the attack on European Jews by Adolf Hitler and the National Socialist Party in Germany and occupied Europe from his accession as chancellor in 1933 until the end of the Third Reich in 1945.
- HIST 577. Early Russia 3 cr.
Domestic affairs and international relations from the rise of the Kievan state to the mid-nineteenth century.
- HIST 578. Modern Russia 3 cr.
Domestic policies and international relations from the mid-nineteenth century to the present with emphasis on the Soviet experience.
- HIST 579. Oral History 3 cr.
Oral history through readings, discussion, and interviews. Course project required that includes an interview and transcription.
- HIST 580. Graduate Research Projects 1-6 cr.
Intensive investigation of a selected area of history, including the completion of a research paper or a public history project. Consent of instructor required.
- HIST 581. Time Traveling Through New Mexico's Past 3 cr.
Instructs historians and educators on how to make history come alive. Semester project includes role playing characters and activities from a past era with local schools and museums.
- HIST 582. History and Memory 3 cr.
Seminar examines the interplay of memory and history. Explores how various nations and people construct the narratives of their past.
- HIST 583. Advanced Historic Preservation 3 cr.
Covers the community development, the historic preservation movement, and the built environment. Field project and additional graduate work.
- HIST 584. Advanced Historical Editing: Theory and Practice 3 cr.
Readings and projects in historical editing at the NMSU Archives. Includes editing papers and helping to produce a scholarly journal.
- HIST 585. Public History Internship 3 cr.
Individual project in an area of public history, including a final written report. Research project required. Prerequisite: consent of instructor. May be repeated for a maximum of 9 credits.
- HIST 586. Interpreting Historic Places for the Public 3 cr.
Advanced study of historic site interpretation, the scholarship and philosophy of historic interpretation, and the nature of heritage interpretation for historic places.
- HIST 587. United States Labor History to 1877 3 cr.
Seminar discussions explore United States labor and working-class history to 1877, including such topics as pre-industrial and industrial labor, slavery, debt peonage, indentured servitude and housework. May explore the history of labor organization, working-class culture and leisure activities, and responses to labor issues by the state.
- HIST 588. United States Labor History since 1877 3 cr.
Seminar discussions explore United States labor and working-class history since 1877, including such topics as pre-industrial and industrial labor, slavery, debt peonage, indentured servitude and housework. May explore the history of labor organization, working-class culture and leisure activities and responses to labor issues by the state.
- HIST 590. Reading Seminar: Borders, Boundaries and Frontiers 3 cr.
Explores questions and issues concerning different kinds of borders, boundaries and frontiers. Introduces relevant theoretical literature and considers specific places and times through case studies, including U.S.-Mexico border. Restricted to students in HIST program.
- HIST 591. Reading Seminar: Modernity and its Discontents 3 cr.
Examines the problem of modernization and the meaning of becoming and being modern, including positive and negative effects on individuals, cultures, environments and societies.
- HIST 592. Reading Seminar: Nature and Society 3 cr.
Considers how humans and nature have reshaped each other, how people have perceived nature, how different cultures have understood their relationships to nature, and how social groups and nations have struggled over natural resources. Takes a comparative, transnational approach.
- HIST 593. Reading Seminar: History, Myth and Memory 3 cr.
Course analyzes the complex and often contested process of writing national histories, creating national heroes, and forging collective memories. Students assess written texts, memorials, parades and celebrations.
- HIST 594. Public History Seminar 3 cr.
Introduction to the discipline of public history, including its methodology and literature. Fieldwork is required.
- HIST 595. Research Seminar, Oral History 3 cr.
Research seminar in oral history. Covers techniques, interpretation and use of oral interviewing; techniques of historical writing and documentation.
- HIST 596. Research Seminar 3 cr.
Research seminar teaches students the process of conducting original historical research with primary source documents. Students will then use these research skills to produce a polished chapter or article-length manuscript. Restricted to HIST majors.
- HIST 597. Public History Article 1-9 cr.
Researching and writing an article suitable for publication about a student's public history internship or other topic of interest within the field of public history.
- HIST 598. Craft of History: Historical Theories, Methods, and Criticism (f) 3 cr.
Introduction to historical theories, methodologies, criticism, and skills essential to graduate study in history. Required for all history graduate students; restricted to history majors.
- HIST 599. Master's Thesis 0-88 cr.
Thesis.

MATHEMATICAL SCIENCES

Department website: <http://www.math.nmsu.edu>
(575) 646-3901
gradcomm@nmsu.edu

J. Lakey, department head, Ph.D. (Maryland)-applied harmonic analysis; P. Baggett, Ph.D. (Colorado)-mathematics education; M. Ballyk, Ph.D. (McMaster)-mathematical biology and ecology; E. Barany, Ph.D. (Ohio State)-mathematical physics; G. Bezhanishvili, Ph.D. (Tokyo Institute of Technology)-logic; M. S. Cohen, Ph.D. (Chicago)-mathematical biology, mathematical physics; R. DeBlassie, Ph.D. (MIT)- Probability; D. Finston, Ph.D. (California-San Diego)-algebra; L. Fouli, Ph.D. (Purdue)- commutative algebra; T. Giorgi, Ph.D. (Purdue)- applied mathematics; J. Harding, Ph.D. (McMaster)-logic and foundations; D. S. Kurtz, Ph.D. (Rutgers)-harmonic analysis; G. Lodder, Ph.D. (Stanford)-algebraic topology; M. Mariani, Ph.D. (Buenos Aires)-nonlinear problems with applications to physics and finance, stochastic processes, statistical mechanics, neural networks; H. T. Nguyen, Ph.D. (Lille)-mathematical statistics; P. Morandi, Ph.D. (California-San Diego)-algebra; B. Olberding, Ph.D. (Wesleyan)-commutative algebra, valuation theory and module theory; D. Pengelley, Ph.D. (Washington)- algebraic topology, history of mathematics, mathematics education; D. Ramras, Ph.D. (Stanford)- algebraic topology; S. Salamanca-Riba, Ph.D. (M.I.T.)-Lie groups and representation theory; R. Smits, Ph.D. (Purdue)-probability, harmonic analysis; R. Staffeldt, Ph.D. (California-Berkeley)-algebraic topology; T. Stanford, Ph.D. (Columbia)-low dimensional topology; T. Wang, Ph.D. (Windsor)-mathematical statistics. Associated Faculty: Annie Selden, Ph.D. (Clarkson)-mathematics education; John Selden, Ph.D. (Georgia)-mathematics education.

DEGREE: Master of Science
MAJOR: Mathematics

DEGREE: Professional Master of Financial Mathematics

DEGREE: Doctor of Philosophy
MAJOR: Mathematics

MINOR: Mathematics

The Department of Mathematical Sciences offers graduate instruction leading to the Master of Science degree, Doctor of Philosophy degree, and a Professional Master's Degree in Financial Mathematics. Possible areas of study are various topics in pure mathematics and applied mathematics, statistics, and mathematics education. Students may also pursue an interdisciplinary program of study. Our program has 50 to 60 graduate students, most of them supported by a combination of teaching assistantships, research assistantships, fellowships, and job opportunities at nearby teaching or research units.

The composition of our graduate student body shows a diversity of ethnicity, gender, age, work experience, and interests. The high ratio of faculty to students promotes individual attention and an atmosphere of collegiality. Our excellent facilities include private or semi-private offices for graduate assistants, computer labs, reading room, classrooms, lounge and seminar rooms. Students have the opportunity to participate in our nationally recognized innovative teaching activities.

For more information on our programs and on our working environment, and to learn more about the research interests of the faculty, please see our web site at www.math.nmsu.edu, phone us at (575) 646-3901, or write to Graduate Secretary, Department of Mathematical Sciences, NMSU, Las Cruces, NM 88003-8001, email: gradcomm@nmsu.edu

Students applying for regular admission to graduate study in mathematics are expected to have 24 credits of upper-division courses in mathematics and statistics, including a three-credit course in modern analysis and a three-credit course in modern algebra. Students who do not meet these requirements may be admitted with deficiencies and allowed to complete the requirements at New Mexico State University.

The minimum application to be admitted as a regular graduate student in mathematics includes:

1. a completed Graduate School admission application,
2. complete transcripts of all undergraduate and graduate work,
3. application fee,
4. three letters of recommendation from professors, employers, or others who are qualified to judge potential for graduate work in mathematics,
5. a one-page statement of educational objectives.

Items 1, 2, and 3 should be submitted to the Graduate School by domestic applicants and to the Center for International Programs by international applicants. Items 4 and 5 and copies of items 1 and 2 should be submitted to the Department of Mathematical Sciences.

Although GRE subject test scores are not required for admission, applicants are encouraged to submit them, if available. The test scores may be used to help allocate available teaching assistantships among entering students.

To ensure full consideration for admission, candidates should submit their applications by the following deadlines:

Application Deadlines-Domestic Applicants:

Semester	Admission only	Admission /Financial Aid
Fall	July 1	February 1
Spring/Summer	October 1	October 1

Application Deadlines-International Applicants:

Semester	Admission only	Admission /Financial Aid
Fall	February 1	February 1
Spring/Summer	October 1	October 1

DEGREE: Master of Science
MAJOR: Mathematics

The Master's degree is designed to increase one's knowledge and understanding of mathematics beyond the Bachelor's degree level. It also prepares a student for future graduate work.

A candidate for a master's degree may select up to two minors in addition to the major. A minimum of 8 credits of graduate work is necessary for a minor.

Minimum Requirements for the Master's Degree

1. In fulfillment of the Graduate School requirement of a minimum of 30 semester credits of course work, the student must take at least 24 credits of mathematics or statistics, 15 of which must be in courses numbered above 529. At most 6 credits of individual study courses such as MATH 540 or STAT 540 may be used to fulfill the course requirement.
2. The student must complete, transfer, or challenge MATH 525, MATH 527, MATH 528, and MATH 581.
3. MATH 459 may not be used to fulfill any of these requirements.
4. The student's program of study must be approved by the departmental Graduate Studies Committee.
5. The student must successfully complete a final master's examination.

The Master's Final Examination

The Master's final examination is an oral examination administered by the student's committee and covers the student's coursework. The student's committee, which consists of at least three departmental members and a Graduate faculty member from another department who serves as the Dean's representative. If the student has a minor area of study, then either the member appointed by the Graduate School or a fifth member must come from the minor department. The examination is restricted to course work presented in the student's program of studies. When a master's thesis has been written, the master's final exam will be in part an oral defense of the thesis and in part a general examination of the candidate's course work. The oral exam must be completed at least 10 days prior to the end of the semester in which the candidate wishes to receive the degree.

DEGREE: Professional Master of Financial Mathematics

The Professional Master in Financial Mathematics Program prepares students for successful careers in the financial industry or energy sector, including banks, insurance companies, investment and securities firms, energy companies, utilities, and corporations with exposure to exchange rate or commodities risk. The program provides students with a solid mathematics and statistics background complemented by studies in financial management and financial mathematics including sophisticated problems directly originating from the financial industry. Financial Mathematicians are expected to work in financial product development and pricing, risk management, and portfolio management. Course Requirements for the Professional Master's Degree

1. MATH 518, MATH 521, MATH 522, MATH 577
2. STAT 525, STAT 535
3. FIN 511, FIN 535, FIN 545
4. FIN 590, or any additional FIN course numbered 500 and above with consent of advisor, or MATH 523.

DEGREE: Doctor of Philosophy
MAJOR: Mathematics

Candidates for the Ph.D. degree in the Department of Mathematical Sciences must pass a qualifying examination, three comprehensive written examinations, a basic mathematical reading knowledge test in a language other than English, a comprehensive oral examination, a series of courses, and a final oral doctoral thesis examination. These are briefly described below. For more information, see the Graduate School requirements in this catalog, and the Mathematics Graduate Student handbook at www.math.nmsu.edu

Qualifying examination: Every student admitted to the Ph.D. program must complete the Ph.D. oral qualifying examination. Its purpose is to determine the areas in which the student shows strength or weakness, as well as the ability to assimilate subject matter presented at the graduate level. Students who complete their mathematics master's degree at NMSU may request at the time of applying for their master's oral final examination that the Master's examination also fulfill the Ph.D. qualifying examination requirement. In all other cases, towards the end of the student's first semester in the Ph.D. program, the student and his or her adviser will convene an oral examination with three examiners, the examiners being the adviser and some of the student's current or past instructors.

Written comprehensive examinations: Candidates for the Ph.D. degree must pass written comprehensive examinations in three of the seven areas of algebra, complex analysis, differential equations, logic and foundations, real analysis, statistics, and topology.

To ensure adequate breadth, a combination of three comprehensive examinations is admissible only if it includes real analysis, and at least one of algebra and topology.

The seven examinations are based on the following comprehensive examination sequence courses: Algebra (MATH 525, MATH 581, MATH 582), Complex Analysis (MATH 517, MATH 591, MATH 592), Differential Equations (MATH 518, MATH 531, MATH 532), Logic and Foundations (MATH 504, MATH 557, MATH 585), Real Analysis (MATH 527, MATH 528, MATH 593, MATH 594), Probability and Statistics (STAT 562, STAT 571), and Topology (MATH 541, MATH 542).

Course requirements: Before graduation, a student must pass a total of four comprehensive exam sequences, but needs to take the comprehensive examinations in only three of them. Together, the four sequences must include three of the four sequences in Algebra, Complex Analysis, Real Analysis, and Topology. In addition, a student must pass four more (one-semester) regular MATH/STAT courses (not individualized study) above MATH/STAT 529.

A student may pass any of the four comprehensive examination sequences before enrolling as a Ph.D. student, but the four additional courses have to be passed after enrolling as a Ph.D. student.

The following individualized study courses will not count towards the course requirements: MATH/STAT 540, MATH/STAT 598, MATH 599, MATH 600, MATH 700.

Students and advisers are encouraged to consider further courses beyond this minimum.

Foreign language examination: The department requires that each Ph.D. student pass a basic mathematical reading knowledge exam in a language, other than English, relevant to the student's research interests. This exam is coordinated by the student's adviser and consists of the open-dictionary written translation into English of a mathematical text of interest to the student. The language requirement must be fulfilled prior to the oral part of the Ph.D. comprehensive examination.

Oral Comprehensive Exam: The student must take this exam at the end of the semester after completing the written comprehensive exams. The student should present a proposed direction for thesis work.

Final Oral Exam: This should be an exam over the student's thesis and administered by the same committee of the oral comprehensive exam.

MATHEMATICS

MATH 451. Introduction to Differential Geometry	3 cr.
Applies calculus to curves and surfaces in three dimensional Euclidean space. Prerequisites: MATH 280 and MATH 391, or consent of instructor.	
MATH 452. Foundations of Geometry	3 cr.
Topics in projective, axiomatic Euclidean or non-Euclidean geometries. Prerequisite(s): C or better in Math 331 or Math 332.	
MATH 453. Introduction to Topology	3 cr.
Introduction to topological spaces and metric spaces, with connections to analysis, geometry, and the classification of surfaces. Prerequisite: MATH 332 or consent of instructor.	
MATH 454. Mathematical Logic	3 cr.
Propositional calculus and the first order predicate calculus, including Gödel's completeness theorem for the latter, and additional topics at the option of the instructor. Prerequisite(s): C or better in Math 331 or Math 332, or consent of instructor.	
MATH 455. Elementary Number Theory	3 cr.
Covers primes, congruences and related topics. Prerequisite: grade of C or better in MATH 331 or consent of instructor.	
MATH 457. Topics in Algebra	3 cr.
Topics may include coding theory, cryptography, algebraic geometry, or symmetry groups. Prerequisites: C or better in Math 331.	
MATH 459. Survey of Geometry	3 cr.
Basic concepts of Euclidean geometry, ruler and compass constructions. May include topics in non-Euclidean geometry. For non-math majors. Prerequisite(s): C or better in Math 331 or Math 332.	
MATH 466. Lattice Theory	3 cr.
Introduction to partially ordered sets, distributive, modular, and Boolean lattices. Prerequisites: MATH 330 or MATH 331 or MATH 332 or consent of instructor.	
MATH 471. Complex Variables	3 cr.
A first course in complex function theory, with emphasis on applications. Prerequisite: MATH 391 or both MATH 392 and MATH 291G.	
MATH 472. Fourier Series and Boundary Value Problems	3 cr.
Fourier series and methods of solution of the boundary value problems of applied mathematics. Prerequisite: MATH 392.	

MATH 473. Calculus of Variations and Optimal Control	3 cr.
Euler's equations, conditions for extrema, direct methods, dynamic programming, and the Pontryagin maximal principle. Prerequisite: MATH 392.	
MATH 475. Business Applications	3 cr.
Taught with MATH 375 with additional work. Does not fulfill requirements for degrees in mathematics. Prerequisite(s): C or better in Math 142G, or in MATH 191G, or in Math 235.	
MATH 480. Matrix Theory and Applied Linear Algebra	3 cr.
An application driven course, whose topics include rectangular systems, matrix algebra, vector spaces and linear transformations, inner products, and eigenvalues and eigenvectors. Applications may include LU factorization, least squares, data compression, QR factorization, singular value decomposition, and search engines. Prerequisite(s): C or better in any 300-level course with a MATH or STAT prefix.	
MATH 481. Advanced Linear Algebra	3 cr.
Rigorous treatment of vector spaces and linear transformations including canonical forms, spectral theory, inner product spaces and related topics. Prerequisite: grade of C or better in MATH 331.	
MATH 491. Introduction to Real Analysis I	3 cr.
Rigorous discussion of the topics introduced in calculus. Sequences, series, limits, continuity, differentiation. Prerequisite: grade of C or better in MATH 332 or consent of instructor.	
MATH 492. Introduction to Real Analysis II	3 cr.
Continuation of MATH 491. Integration, metric spaces and selected topics. Prerequisite: MATH 491 or consent of instructor.	
MATH 498. Directed Reading	1-6 cr.
May be repeated for a maximum of 6 credits. Graded S/U.	
MATH 501. Introduction to Differential Geometry	3 cr.
Same as MATH 451 with additional work for graduate students.	
MATH 502. Foundations of Geometry	3 cr.
Same as MATH 452 with additional assignments for graduate students.	
MATH 503. Introduction to Topology	3 cr.
Same as MATH 453 with additional work for graduate students.	
MATH 504. Mathematical Logic	3 cr.
Same as MATH 454 with additional assignments for graduate students.	
MATH 505. Elementary Number Theory	3 cr.
Same as MATH 455 with additional assignments for graduate students.	
MATH 506. Lattice Theory	3 cr.
Same as MATH 466 with additional assignments for graduate students.	
MATH 507. Topics in Algebra	3 cr.
Topics may include coding theory, cryptography, algebraic geometry, or symmetry groups. Same as Math 457 with additional work for graduate students. Prerequisites: C or better in Math 331.	
MATH 509. Information Theory	3 cr.
This class is a study of Shannon's measure of information and discusses mutual information, entropy, and channel capacity, the noiseless source coding theorem, the noisy channel coding theorem, channel coding and random coding bounds, rate-distortion theory, and data compression. Prerequisite(s): EE 571 or Stat 515. Crosslisted with: EE 586	
MATH 511. Fundamentals of Elementary Mathematics I	3 cr. (3+1P)
Topics from real numbers, geometry, measurement, and algorithms, incorporating calculator technology. Intended for K-8 teachers. As part of course students mentor MATH 111 undergraduates. Does not fulfill degree requirements for M.S. in mathematics.	
MATH 512. Fundamentals of Elementary Mathematics II	3 cr. (3+1P)
Real numbers, geometry, and statistics, incorporating calculator technology. Intended for K-8 teachers. Students serve as mentors to MATH 112 undergraduates. Does not fulfill degree requirements for M.S. in mathematics.	
MATH 513. Fundamentals of Algebra and Geometry I	3 cr. (3+1P)
Algebra and metric geometry, incorporating appropriate calculator technology. Intended for K-8 teachers. Students serve as mentors to MATH 313 undergraduates. Does not fulfill degree requirements for M.S. in mathematics.	
MATH 514. Math and Science with Technology	3 cr.
Experiments involving measurements, primarily in physics; actual outcomes are compared with theoretical results. Intended for teachers of grades 3 through 12. Students serve as mentors to MATH 314 undergraduates. Does not fulfill degree requirements for M.S. in mathematics. Prerequisites: MATH 511 and MATH 512 or consent of instructor.	
MATH 515. Fundamentals of Algebra and Geometry II	3 cr.
Algebra and its applications to geometry, incorporating scientific and graphing calculator technology. Intended for upper elementary, middle and high school teachers. As part of course, students may be required to mentor MATH 315 undergraduates. Does not fulfill degree requirements for	

- M.S. in Mathematics. Prerequisite: MATH 513.
- MATH 516. Calculus with Hands-on Application 3 cr.
This course, primarily for in-service teachers, is taught in an interactive laboratory format. Students design and construct physical objects for which the planning stage requires calculus techniques. All numerical computations are carried out on graphing calculators. Meets simultaneously with Math 316, primarily for prospective teachers. Does not fulfill degree requirements for M.S. in Mathematics. Prerequisite(s): Math 511 and Math 512 or consent of instructor.
- MATH 517. Complex Variables 3 cr.
Same as MATH 471 with additional work for graduate students.
- MATH 518. Fourier Series and Boundary Value Problems 3 cr.
Same as MATH 472 with additional work for graduate students.
- MATH 519. Calculus of Variations and Optimal Control 3 cr.
Same as MATH 473 with additional work for graduate students.
- MATH 521. Financial Mathematics I: Portfolio Optimization 3 cr.
Complete and incomplete markets, optimal investment paths, dynamic optimization, the Black-Scholes model, European options, American options. Prerequisite: STAT 515 and either MATH 280 or MATH 480.
- MATH 522. Financial Mathematics II 3 cr.
Bonds, Swaps, Exotic options, Barrier options, Asian options, Lookback options, options with transaction costs, Fokker Plank theory: computing expectations, The Heath-Jarrow-Morton theorem, the Ho-Lee model, Stochastic volatility models, Exponential-Affine models, numerical methods. Prerequisite: MATH 521.
- MATH 523. Numerical Optimization and Applications to Financial Mathematics 3 cr.
Dynamic optimization of a monopolist, trading off inflation and unemployment, the optimal adjustment of labor demand, infinite planning horizon, the optimal investment path of a firm, the optimal social saving behavior, phase-diagram analysis, optimal control theory, the political business cycle, the dynamics of a revenue-maximizing firm, economic examples of state-space constraints. This course is offered simultaneously with Math 423. Prerequisite: Math 521.
- MATH 525. Advanced Linear Algebra 3 cr.
Same as MATH 481 with additional work for graduate students. Prerequisite: grade of C or better in MATH 331.
- MATH 527. Introduction to Real Analysis I 3 cr.
Same as MATH 491 with additional work for graduate students.
- MATH 528. Introduction to Real Analysis II 3 cr.
Same as MATH 492 with additional work for graduate students.
- MATH 530. Special Topics 1-3 cr.
Specific subjects to be announced in the Schedule of Classes. May be for unlimited credit with approval of the department.
- MATH 531. Ordinary Differential Equations 3 cr.
Linear algebra and linear ordinary differential equations, existence and uniqueness of solution, smooth dependence on initial conditions, flows, introduction to smooth dynamical systems. Prerequisites: MATH 392 and MATH 527, or consent of instructor.
- MATH 532. Partial Differential Equations 3 cr.
The basic equations of mathematical physics. Elliptic, hyperbolic, and parabolic equations. Characteristic surfaces. Well-posed problems. Prerequisite: MATH 518 or consent of instructor.
- MATH 533. Linear Programming 3 cr.
Linear programming problem formulation, simplex method, theory of linear programming, dual problem, transportation problem, and postoptimality analysis. Prerequisite: I E 531 or MATH 480 or consent of instructor. Same as I E 533.
- MATH 534. Nonlinear Programming 3 cr.
Theoretical and computational methods to solve optimization problems in engineering, statistics, economics, and operations research. Topics include convexity, optimality conditions, Newton's method, Lagrange multipliers, search algorithms for unconstrained and constrained problems, as well as barrier and penalty methods.
- MATH 541. Topology I 3 cr.
Topological spaces, connectedness, compactness, Tychonoff's theorem, separation axioms, Tietze's extension theorem, Urysohn's metrization theorem, elementary homotopy theory, the fundamental group, the Seifert-van Kampen theorem. Prerequisites: MATH 525 and MATH 528, or consent of instructor.
- MATH 542. Topology II 3 cr.
Covering spaces and their classification, CW-complexes, singular and cellular homology, Brouwer's fixed point theorem, and other applications. Prerequisites: MATH 541 or consent of instructor.
- MATH 555. Differentiable Manifolds 3 cr.
Differentiable structures, tangent bundles, vector fields and differential equations, differential forms, integration, and topics chosen by the instructor. Consent of instructor required. Prerequisite(s): MATH 525 and Math 528, or consent of instructor.
- MATH 557. Axiomatic Set Theory 3 cr.
A detailed study of Zermelo-Fraenkel and Bernays set theories. Prerequisite: MATH 504 or equivalent.
- MATH 561. The Role of History in the Teaching of Mathematics 3 cr.
In-depth study of selected mathematical topics through examination of their historical development, with emphasis on studying original sources. Pedagogical aspects of using history and original sources in teaching mathematics. Research and preparation of classroom materials based on original sources.
- MATH 563. Linear Algebra for Middle School Teachers 3 cr.
Systems of linear equations, matrices, and matrix algebra. Does not fulfill requirements for degrees in mathematics. Prerequisite: MATH 185 or equivalent.
- MATH 565. Modeling Linear Decisions for Middle School Teachers 3 cr.
Introduction to linear decision-making algorithms. Topics include network models, systems of equations and linear programming. Does not fulfill requirements for degrees in mathematics. Prerequisite: MATH 185 or equivalent.
- MATH 567. Geometry for Middle School Teachers 3 cr.
Topics may include Euclidean geometry, 2-dimensional and 3-dimensional coordinate geometry, and applications of these. Part of the MAT program for middle school teachers. Does not fulfill requirements for degrees in mathematics. Prerequisite: MATH 185 or equivalent.
- MATH 568. Discrete Mathematics for Middle School Teachers 3 cr.
Introduction to discrete mathematics. Topics may include counting techniques, graph theory, social decision making, and the mathematics of iteration and recursion. Part of the MAT program for middle school teachers. Does not fulfill requirements for degrees in mathematics. Prerequisite: MATH 185 or equivalent.
- MATH 573. Numerical Linear Algebra 3 cr.
An advanced course in matrix theory, centered on a study of algorithms for finding eigenvalues and eigenvectors, inverting matrices, and solving linear systems in particular the large, sparse linear systems which arise in solving partial differential equations by finite differences. Prerequisite: MATH 480 or MATH 482 or equivalent. Some computing experience is desirable.
- MATH 577. Numerical Analysis I 3 cr.
Topics may include interpolation, differential equations, nonlinear equations, optimization. Prerequisites: MATH 480 and 527, or consent of instructor.
- MATH 581. Algebra I 3 cr.
Examines groups, commutative rings, solvability of polynomials, Galois theory, ruler and compass constructions. Prerequisite/corequisite: MATH 525.
- MATH 582. Algebra II 3 cr.
Group actions, fundamental theorem of finite Abelian groups, Sylow theorems, solvable groups, noncommutative rings, Noetherian rings, unique factorization domains, modules, tensor products. Prerequisite: MATH 581.
- MATH 583. Algebraic Number Theory 3 cr.
Number fields and number rings, prime decomposition in number rings, ideal theory and the ideal class group, and selected other topics. Prerequisite: MATH 581 or consent of instructor.
- MATH 584. Representation Theory 3 cr.
Topics from representation theory of finite or infinite groups. Prerequisite: consent of instructor. May be repeated for a maximum of 9 credits.
- MATH 585. Universal Algebra 3 cr.
Universal algebra and category theory. Theorems of Birkhoff and Tarski relating equational classes, free algebras and their construction through homomorphisms, subalgebras and products. Topics from model theory, sheaf theory and representation by subdirect products. Prerequisite: consent of instructor. May be repeated for a maximum of 6 credits.
- MATH 586. Nonlinear Dynamics I 3 cr.
Same as PHYS 586.
- MATH 591. Complex Analysis I 3 cr.
Rigorous treatment of complex differentiation and integration, properties of analytic functions, series and Cauchy's integral representations. Prerequisites: MATH 517 and MATH 528, or consent of instructor.
- MATH 592. Complex Analysis II 3 cr.
Harmonic functions, product representations, conformal mappings, Riemann's mapping theorem, Riemann surfaces, and selected other topics. Prerequisite: MATH 591 or consent of instructor.
- MATH 593. Measure and Integration 3 cr.
Measure spaces, measurable functions, extension and decomposition theorems for measures, integration on measure spaces, absolute continu-

ity, iterated integrals. Prerequisite: MATH 528 or consent of instructor.	
MATH 594. Real Analysis	3 cr.
Differentiation, Lp spaces, Banach spaces, measure and topology, other selected topics. Prerequisite: MATH 593.	
MATH 598. Special Research Programs	1-3 cr.
Individual analytical or experimental projects. Maximum of 3 credits per semester. More than 3 credits total requires approval of graduate committee. Six credits maximum.	
MATH 599. Master's Thesis	0-88 cr.
Thesis.	
MATH 600. Doctoral Research	1-88 cr.
Research.	
MATH 601. Special Topics	1-3 cr.
Specific subjects to be announced in the Schedule of Classes. May be repeated for unlimited credit with approval of the department.	
MATH 643. Topology III	3 cr.
Topics may include higher homotopy groups, fibrations, cohomology operations and obstruction theory, spectral sequences, or others chosen by instructor. Prerequisites: MATH 542 or consent of instructor. May be repeated for a maximum of 9 credits.	
MATH 649. Applications of Tensor Analysis	3 cr.
Same as PHYS 649.	
MATH 655. Topics in Differential Geometry	3 cr.
Representation theory of Lie groups, Riemannian geometry, or another topic chosen by instructor. Content varies. Prerequisite: MATH 555 or consent of instructor. May be repeated for a maximum of 9 credits.	
MATH 683. Homological Algebra	3 cr.
Basic topics in homological algebra and category theory. Prerequisite: MATH 542 or MATH 582 or consent of instructor. May be repeated for a maximum of 9 credits.	
MATH 686. Nonlinear Dynamics II	3 cr.
Same as PHYS 686.	
MATH 695. Introduction to Functional Analysis I	3 cr.
Banach spaces. The three basic principles: uniform boundedness principle, closed graph/open mapping theorems, Hahn-Banach theorem. Prerequisites: MATH 541 and MATH 594, or consent of instructor.	
MATH 696. Introduction to Functional Analysis II	3 cr.
Continuation of MATH 695. Topics selected from topological vector spaces, Hilbert space, spectral theory, Banach algebras, and distribution theory. Prerequisite: MATH 695 or consent of instructor.	
MATH 698. Selected Topics	1-88 cr.
Selected topics.	
MATH 700. Doctoral Dissertation	1-88 cr.
Dissertation.	

STATISTICS

STAT 470. Probability: Theory and Applications	3 cr.
Basic probability distributions including binomial, normal; random variables, expectation; laws of large numbers; central limit theorem. Prerequisites: MATH 291G and at least one-300 level Math course.	
STAT 480. Statistics: Theory and Applications	3 cr.
Point and interval estimation; sufficiency; hypothesis testing; regression; analysis of variance; chi-square tests. Prerequisite: STAT 470.	
STAT 515. Probability: Theory and Applications	3 cr.
Same as STAT 470 with additional work for graduate students.	
STAT 525. Statistics: Theory and Applications	3 cr.
Same as STAT 480 with additional work for graduate students.	
STAT 530. Special Topics	3 cr.
Specific subjects to be announced in the Schedule of Classes. May be repeated for unlimited credit with approval of department.	
STAT 535. Elementary Stochastic Processes	3 cr.
Markov chains, Poisson processes, Brownian motion, branching processes, and queuing processes, with applications to the physical, biological, and social sciences. Prerequisite: STAT 515 or consent of instructor.	
STAT 540. Directed Reading	1-6 cr.
Prerequisite: consent of instructor and graduate committee. May be repeated for a maximum of 6 credits. Graded S/U.	
STAT 562. Foundations of Probability	3 cr.
Probability spaces, expectation and conditional expectation, limit theorems and laws of large numbers. Prerequisite: MATH 593.	
STAT 571. Continuous Multivariate Analysis	3 cr.
Theory and applications of the multivariate normal distribution. Prerequisites: MATH 480 and STAT 525, or consent of instructor.	

STAT 572. Linear Models	3 cr.
Theory of regression, analysis of variance, analysis of covariance in various linear models. Prerequisite: STAT 571.	
STAT 581. Advanced Theory of Statistics I	3 cr.
Testing hypotheses, probability and sufficiency, uniformly most powerful tests, unbiasedness, invariance, and minimax principle. Prerequisite: STAT 525 or consent of instructor.	
STAT 582. Advanced Theory of Statistics II	3 cr.
Estimation of parameters; unbiased estimators; equivariance; Bayes properties; large sample theory and optimality. Prerequisite: STAT 581 or consent of instructor.	
STAT 598. Special Research Problems	1-3 cr.
Individual investigations or consulting programs. Maximum of 3 credits.	
STAT 601. Special Topics	1-3 cr.
Specific subjects to be announced in the Schedule of Classes. May be repeated for unlimited credit with approval of the department.	

MOLECULAR BIOLOGY

Department Website:<http://research.nmsu.edu/molbio/>
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A. Ashley, Ph.D. (Colorado State University), Center for Animal Health and Safety- DNA replication and repair; P. Cooke, Director of Electron Microscopy Lab Director of Electron Microscopy Lab, Ph.D. (New Hampshire- Durham); R. Creamer, Program Director, Ph.D. (California-Davis), Department of Entomology, Plant Pathology, and Weed Science-plant virology, fungal endophytes; D. Cowley, Ph.D. (University of Wisconsin-Madison), Department of Fish, Wildlife and Conservation Ecology – ecological and conservation genetics; J. Curtiss, Ph.D. (University of Colorado-Boulder), Department of Biology–molecular genetics of eye development; A. Dawe, Ph.D. (Tennessee), Department of Biology-molecular biology of plant-fungal and virus-host interactions; J.E. Gustafson, Ph.D. (Zurich-Switzerland) Department of Biology-microbiology and antimicrobial resistance mechanisms S.aureus; K. A. Hanley, Ph.D. (University of California San Diego) Department of Biology-emerging vector-borne viruses; I. Hansen, Ph.D., (University of Wurzburg, Germany), Department of Biology – molecular vector biology; S. Hanson (Wisconsin), Department of Entomology, Plant Pathology, and Weed Science- viral plant pathogens; J. Houston, Ph.D. (Texas A&M), Department of Chemical Engineering- flow cytometry and molecular imaging; K. Houston, Ph.D. (University of Texas)- Department of Chemistry and Biochemistry; J. Jun, Ph.D (New Mexico State University)-molecular biology-DNA sequencing; J. He, Ph.D. (Baylor), Department of Computer Science-protein structure prediction; G. D. Kuehn, Ph.D. (Washington State), Department of Chemistry and Biochemistry-polyamine biochemistry, plant wound/repair mechanism; M. Lucero, Ph.D. (New Mexico State) Jornada Experimental Range (USDA-ARS) – plant-fungal interactions; S. Lusetti, Ph.D. Department of Chemistry and Biochemistry-DNA replication, recombination and repair; B. A. Lyons, Ph.D. (Cornell University) Department of Chemistry and Biochemistry–elating structure to function, specifically the Grb7 protein family; M. K. Nishiguchi, Ph.D. (California-Santa Cruz), Department of Biology–molecular and ecological basis of speciation, coevolution of symbiotic relationships; J. Randall, Ph.D. (New Mexico State University), Department of Entomology, Plant Pathology, and Weed Science- molecular plant physiology and plant/microbe interactions; I. Ray, Ph.D. (Wisconsin-Madison), Department of Plant and Environmental Sciences-plant genetic engineering, primary and secondary metabolism, stress, legumes; A. Rowland, Ph.D., (University of Utah), Department of Chemistry and Biochemistry – gene regulation of extrahepatic of metabolic enzymes (cytochrome P450s); C. Sengupta-Gopalan, Ph.D. (Ohio State), Department of Plant and Environmental Sciences-nitrogen-fixation, plant-bacterial interactions; E. E. Serrano, Ph.D. (Stanford), Department of Biology-membrane biophysics and molecular neurobiology; C. B. Shuster, Ph.D. (Tufts University) Biology-regulation of mitosis and cytokinesis, role of the cytoskeleton during early development; G. Smith, Ph.D. (North Carolina State), Department of Biology-environmental gene probes, microbial biodegradation; M. Thomas, Ph.D. (Texas A&M), Department of Animal and Range Sciences-physiological genetics of ruminants; A. Unc, Ph.D. (Guelph- Ontario)- Department of Plant and Environmental Sciences- soil science; G. A. Unguez, Ph.D. (California-Los Angeles), Department of Biology-electric organ developmental biology; W. Van Voochries, Ph.D. (Arizona)-lifespan regulation in nematodes and insects; H. Vilchis-Licon, M.D., M.P.H.(UNAM), Director, Border Epidemiology and Environmental Health

Center-epidemiology; J. Xu, Ph.D. (Second Military Medical University, China) Department of Biology-functional genomics and population genetics of mosquito-malaria interactions; J. Zhang, Ph.D. (University of Arkansas) Department of Plant and Environmental Sciences—cotton genetics, genomics and molecular biology

DEGREE: Master of Science

MAJOR: Molecular Biology

DEGREE: Doctor of Philosophy

MAJOR: Molecular Biology

MINOR: Bioinformatics (with Computer Science)

THE MOLECULAR BIOLOGY PROGRAM

Students of the molecular life sciences seek to reduce complex biological processes to a set of understandable molecular or chemical structure and function relationships. Integration of this knowledge into the context of complex living tissues interacting with the environment is the ultimate goal. This requires that the expertise from many diverse traditional disciplines be directed along converging experimental lines. The Ph.D. program in molecular biology is designed to facilitate an interdisciplinary approach to graduate research, utilizing both traditional techniques and the latest advances in biotechnology, including the extraordinary power of recombinant DNA methodology. Participants in this program will take core courses in biochemistry, molecular biology and cell biology. Subsequent course work will be tailored for the individual student, depending upon his or her research emphasis. Participation in regular seminar programs will be expected to provide students with the widest possible scientific background. Financial aid, in the form of a limited number of MB teaching and research assistantships, is available on a competitive basis. Research Assistantships may also be available from individual faculty within the Molecular Biology (MB) program. Only the most competitive students are admitted with assistantship support.

The MB program offers curricula leading to the M.S. and Ph.D. degrees in the areas of biochemistry, molecular genetics, molecular biology, cell biology, bioinformatics, and microbiology. Admission to the MB Program without deficiency is based on an undergraduate program essentially equivalent to that pursued by an undergraduate major in chemistry, biology, agronomy, horticulture, biochemistry, or microbiology at this university. An entering student is required to complete the Graduate Record Examination (General Aptitude). Undergraduate deficiency courses must be passed with a minimum grade of B.

Applicants are strongly encouraged to contact at least three individual program faculty before applying to identify a prospective advisor and laboratory in which to pursue graduate research. Previous course records and GPA standings (typically minimum of 3.3/4.0), GRE scores (typically minimum of 1150 combined verbal and quantitative), TOEFL scores of foreign applicants (typically minimum of 550 on the paper-based or 213 on the computer-based), a letter of interest from the applicant that identified faculty laboratories of interest, and three letters of reference regarding research performance or potential are weighted heavily during the selection process.

Students with a B.S. degree in one of the disciplines listed above can expect to earn the M.S. degree in about 30 credits, including at least 6 credits of thesis research. The Ph.D. degree can be earned in about 30 to 40 credits of formal course work, plus additional thesis research credits, for a minimum total of 75 credits beyond the B.S. Because research is central in both the M.S. and Ph.D. curricula, early selection of a research adviser is required. Ph.D. degree candidates will successfully complete a written and oral qualifying examination based on their proposed research and the subject matter in the core courses (below) at the end of the first year of study. Also at this time, the master's or doctoral committee is organized to assist in planning a program appropriate to the background and goals of the student. Ph.D. candidates will subsequently complete a comprehensive written examination and oral examination approximately at the end of the second year of study. A final, formal presentation and oral defense of the original research documented in the M.S. or Ph.D. thesis completes the degree requirements.

The Molecular Biology program also offers formal minors in molecular biology or bioinformatics. The molecular biology minor consists of 10 credit hours including MOLB 545; either MOLB 520 or MOLB 542; any of the tier II courses; and one MOLB 590 seminar. The bioinformatics minor is jointly offered with the Department of Computer Science and consists of 9 credit hours for Master's students and 12 credit hours for Ph.D. students, including MOLB 470, MOLB 452, and additional courses selected from those listed at <http://research.nmsu.edu/>

molbio/. The courses selected will depend on whether the student is majoring in a biological or non-biological science and include courses from the graduate Computer Science and Molecular Biology curricula. Please inquire with the Molecular Biology Program office for the most recent requirements for the bioinformatics minor.

Phase I Core Courses:

MOLB/BIOL 520, Molecular Cell Biology

MOLB/BCHE 542, Biochemistry I

MOLB/BCHE 545, Molecular and Biochemical Genetics

Molecular Biology Tier II Courses (at least 9 credits):

AGRO/HORT 506, Plant Genetics

AGRO 516, Molecular Analysis of Complex Traits

AGRO / HORT 531, Plant Physiology: Growth and Development

AGRO/HORT 685, Plant Genetic Engineering

ANSC 602, Advanced Reproductive Physiology

ANSC 602L, Molecular Techniques in Reproductive Physiology

ANSC 621, Metabolic Functions and Dysfunctions

BCHE 494, Techniques in Genetic Engineering

BCHE 546, Biochemistry II

BCHE 645, Nucleic Acid Metabolism

BCHE 647, Physical Biochemistry

BCHE 648, Proteins and Enzymes

BIOL 451, Physiology of Microorganisms

BIOL 470, Developmental Biology

BIOL 474, Immunology

BIOL 475, Virology

BIOL 477, Applied and Environmental Microbiology

BIOL 478, Molecular Biology of Microorganisms

BIOL 482, Microbial Systematics

BIOL 490, Neurobiology

BIOL 523, Mechanisms of Microbial Pathogenicity

BIOL 577, Advanced Topics Environmental Microbiology

BIOL 590, Advanced Neurobiology

BIOL 698, Special Topics

CHEM 516, Physical Organic Chemistry

CHEM 517, Synthetic Organic Chemistry

EPWS 486, Plant Virology

MOLB 470/GENE 452, Bioinformatics and Genome Analysis

MOLB/AGRO/HORT 506, Plant Genetics

MOLB 546/BCHE 546, Biochemistry II

MOLB 550, Topics in Molecular Biology

MOLB 650, Advanced Topics in Molecular Biology

TOX 461, Toxicology I

WLSC 488, Conservation Genetics

Other Course Requirements

A ST 505, Statistical Inference I or equivalent course

MOLB 590, Discussions in Molecular Biology

MOLB 597, Laboratory Rotations/Research Discussions

MOLB 599, (6 Thesis Research Credits)

PHIL 540, Ethics or equivalent course

MS candidates must enroll for 6 credits MOLB 599, Master's Thesis. May register for additional credits to maintain full-time status

MOLECULAR BIOLOGY SEMINAR AND RESEARCH COURSES

MOLB 450. Special Topics in Molecular and Cellular Biology 1-3 cr.

Selected topics of current interest in the fields of molecular and cellular biology. Specific topics announced in the Schedule of Classes. May be repeated for a maximum of 6 credits.

MOLB 452. Independent Studies in Bioinformatics 1-3 cr.

Individual investigation, theoretical or experimental, in bioinformatics or computational applications under the supervision of a molecular biology or computation science faculty member. Prerequisite: consent of instructor. May be repeated for a maximum of 6 credits.

MOLB 470. Bioinformatics and Genome Analysis 3 cr.

Introduces basic concepts of bioinformatics and computational tools and methods used to analyze molecular biology data, including alignments, homology searches, advanced searching techniques, protein structure prediction, genome sequencing and analysis, and basic computer topics. Prerequisite: BCHE 396 or equivalent.

MOLB 486. Intermediate Genetics Same as AGRO 486, BIOL 486, and HORT 486.	3 cr.
MOLB 520. Molecular Cell Biology Same as BIOL 520.	3 cr.
MOLB 542. Biochemistry I Same as BCHE 542. B or better required.	3 cr.
MOLB 545. Molecular and Biochemical Genetics Same as BCHE 545 and BIOL 545.	3 cr.
MOLB 546. Biochemistry II Same as BCHE 546.	3 cr.
MOLB 550. Topics in Molecular Biology Selected topics of current interest in field of molecular biology for master s level students.	1-3 cr.
MOLB 590. Discussions in Molecular Biology Oral presentations of ongoing research and/or research proposal for the masters thesis. Must be repeated twice for masters and three times for doctoral students. Graded by 2 options: S/U or Letter Grade	1 cr.
MOLB 595. Tutorial in Computer Software Applications Self-paced tutorial in the use of computer software relevant to molecular, cellular and biochemical research and scholarship. Supervised by the major advisor. Content to be approved by the student s committee. Graded S/U.	1 cr.
MOLB 597. Laboratory Rotations/Research Discussions All entering students are required to take at least one credit, during their first semester, in which they will circulate through at least three different labs working on assigned problems and discussing research programs. May be repeated for a maximum of 4 credits. Graded S/U.	1-3 cr.
MOLB 598. Special Research Programs Individual investigation, experimental or theoretical, under the supervision of a molecular biology faculty member. Course may be repeated up to a total of 6 credits with committee approval.	1-3 cr.
MOLB 599. Master's Thesis Experimental and scholarly research leading to the preparation of a master s thesis.	0-88 cr.
MOLB 600. Molecular Biology Research Laboratory research efforts prior to successful completion of doctoral comprehensive exam.	1-88 cr.
MOLB 650. Advanced Topics in Molecular Biology Discussions and lectures on topics of current interest in molecular biology for doctoral students.	1-3 cr.
MOLB 690. Current Topics in Molecular Biology Formal 45-minute seminar presented orally, with visual aids, by all doctoral students. Only topics outside student s research area may be used.	1 cr.
MOLB 698. Advanced Research Projects Individualized special research assignments for doctoral-level students. Up to 9 credits, with approval of committee. Graded S/U.	1-9 cr.
MOLB 700. Doctoral Dissertation Research Research for doctoral students after completing comprehensive exams.	0-88 cr.

MUSIC

Department website: <http://www.nmsu.edu/~music/>
(575) 646-2421
music@nmsu.edu

W. Clark, interim department head, (Emeritus) Ph.D. (Southern Mississippi)-music education, conducting, brass; J. Alt, D.M.A. (Arizona State)-conducting, choirs; F. Bugbee, D.M.A. (Eastman School of Music)-percussion, theory, world music; W. Clark (Emeritus), Ph.D. (Southern Mississippi)-conducting, music education, brass; M. Hill, Assistant Director of Bands (New Mexico State University)-Music education, conducting, woodwinds; M. Rowe, D.M.A. (Arizona)-voice, vocal pedagogy; J. Shearer, D.M.A. (Eastman School of Music)-performance, literature, and music history.

DEGREE: Master of Music

The Master of Music degree is offered in the following fields: applied music, music education, and conducting. Applicants for this degree are expected to have an undergraduate major in music or music education equivalent to that represented by the B.M. or B.M.E. degree from New Mexico State University. All applicants are required to take the Graduate Diagnostic Exam in music history and theory/analysis in order for the department to obtain a profile

of competency in these areas (see program of study). The music department does not require the Graduate Record Exam. An audition, either in person or by tape recording, is required for entrance into applied music or conducting as a major field. Auditions will be based upon, but not limited to, prescribed repertory for graduate entrance.

General Requirements

The requirements for a Master of Music degree are a minimum of 32 semester credits exclusive of prerequisite and deficiency courses.

Recital Requirements

A graduate recital plus an analytical paper are required of all majors in applied music. Students must be enrolled in applied music during the semester the recital is given. A minimum of 60 minutes of music is required for the recitals. All candidates must demonstrate sufficient pianistic ability to meet the needs relevant to their program. A graduate recital and a project are required of all majors in conducting. A minimum of three major works for the appropriate ensemble is required for the recital. The recital is given after at least 6 hours of graduate conducting courses have been successfully completed.

Program of Study

Diagnostic tests in music history and theory are given each semester and must be taken by all students at the first opportunity after admission.

During the first semester of study, a tentative program of study is worked out by the student in consultation with the adviser in his major field. The program of study is subject to the approval of the department head and the Graduate Music Committee. The student will select, in consultation with his or her adviser, an advisory committee consisting of the adviser, and two additional faculty members.

Candidacy

In order to qualify for candidacy the student must meet the Graduate School requirement of 12 credits of graduate work in residence and must show evidence of a satisfactory quality of work in the required courses, demonstrate the desired progress in applied music, and, where required, submit a recital program or thesis topic for approval.

Thesis

A thesis (6 credits) is optional in music education. Music education majors not writing a thesis must develop and complete a special project before the oral examination.

Final Examination

All Master of Music candidates must take a final oral examination. The final oral examination may not be scheduled until the graduate recital is completed and/or a final draft of the special project (or thesis) has been approved by the candidate's adviser.

Fees

Consult the Music Department concerning fees. Applied lessons (MUS 582, MUS 583) can be taken for either 2 or 4 credits only.

MUSIC

MUS 450. Research Methods Introduction to methodology of music research. Emphasis on important scholarly resources and academic writing. Prerequisite: consent of instructor. Restricted to majors. No S/U option.	3 cr.
MUS 451. Orchestra II Las Cruces Symphony at NMSU, a full symphony orchestra concentrating on masterworks of the literature. Students must assume leadership role. Prerequisite: MUS 150 or consent of instructor. May be repeated for unlimited credit.	1 cr.
MUS 465. Composition III Emphasis on extended compositional techniques, serialization, modern counterpoint. Prerequisites: MUS 365 and MUS 366 or consent of instructor.	3 cr.
MUS 466. Composition IV New music notation and techniques. Open forms, aleatory concepts. Prerequisite: MUS 365 and MUS 366 or consent of instructor.	3 cr.
MUS 470. Special Topics III Designed for highly motivated students. Independent study and individual guidance. May be taken for unlimited credit.	1-3 cr.
MUS 471. Graduate Theory Review Comprehensive and accelerated study of modes, tonality, classical form,	3 cr.

and course content of MUS 213 and MUS 214.		
MUS 475. Intermediate Conducting	3 cr.	Essential conducting technique in preparation for advanced study. Prerequisite: consent of instructor.
MUS 476. Music Cultures of the World: History and Criticism	3 cr.	Listening, criticism, and analysis of musical cultures around the world. Emphasis on non-Western musical traditions and folk music of the world. Open to all majors.
MUS 486. Applied Music Pedagogy and Literature II	2 cr.	Methods, materials, problems, literature, and techniques in teaching individual lessons. Prerequisite: MUS 386 or consent of instructor.
MUS 498. Independent Study	1-3 cr.	For students with a strong musical background wishing to explore content beyond the traditional curriculum. Prerequisite: consent of instructor. Restricted to majors. May be repeated for a maximum of 6 credits.
MUS 511. Survey of Traditional Harmony	3 cr.	Tonal harmony in common practice and theory of the late 17th, 18th, and early 19th centuries. Prerequisites: MUS 214 and MUS 413.
MUS 513. Twentieth Century Style Analysis	3 cr.	Analytical techniques, structural design and compositional materials from Debussy to the Minimalist school.
MUS 518. Seminar in Music Theory	3 cr.	Seminar in Music Theory.
MUS 519. Seminar in Music History	3 cr.	Seminar in Music Theory.
MUS 520. Music of the Middle Ages and Renaissance: History and Literature	3 cr.	An overview of the music of the Middle Ages and Renaissance with an emphasis on history and literature.
MUS 521. Music of the Baroque Era: History and Literature	3 cr.	An overview of the music of the Baroque Era with an emphasis on history and literature.
MUS 522. Music of the Classical Era: History and Literature	3 cr.	MUS 523. Music of the Romantic Era: History and Literature
MUS 523. Music of the Romantic Era: History and Literature	3 cr.	Student will do all the required work for MUS 423, and, in addition, will do independent directed research.
MUS 527. History and Analysis of the Symphony	3 cr.	Historical background and development of the symphony from its inception (ca. 1740s) to mid-twentieth century. Analysis of major works by significant composers with emphasis on Sonata form. Prerequisite: MUS 413. Restricted to majors.
MUS 529. Opera and Music Drama	3 cr. (3+1P)	Lyric drama of the Greeks through works of Wagner and Verdi to contemporary opera. Restricted to majors.
MUS 535. Problems in Music Education	3 cr.	MUS 540. Graduate Recital/Analytical Paper
MUS 540. Graduate Recital/Analytical Paper	4 cr.	
MUS 576. Advanced Wind Conducting I	3 cr.	Prerequisite: MUS 475.
MUS 577. Advanced Wind Conducting II	3 cr.	Prerequisite: MUS 576.
MUS 580. Ensemble Performance	1 cr.	Performance in university bands, orchestra, chorus. May be taken for unlimited credit.
MUS 582. Applied Music	2-4 cr.	For music majors, individual instruction, including improvisation skills and techniques. Students may enroll for 2 or 4 credits. Prerequisites: audition and consent of instructor. May be repeated for a maximum of 16 credits.
MUS 583. Applied Music	2-4 cr.	For music majors, individual instruction, including improvisation skills and techniques. Students may enroll for 2 or 4 credits. Prerequisites: audition and consent of instructor. May be repeated for a maximum of 16 credits.
MUS 586. Applied Music Pedagogy and Literature III	2 cr.	Methods, materials, problems, literature, and techniques in teaching individual lessons. Prerequisite: MUS 486 or consent of instructor.
MUS 590. Supervised Studio Teaching	2 cr.	Teaching of private lessons under supervision.
MUS 598. Special Research Programs	1-4 cr.	May be taken for unlimited credit.
MUS 599. Master's Thesis	0-88 cr.	Thesis.

PHYSICS

Department website: <http://physics.nmsu.edu/>
(575) 646-3831
physics@nmsu.edu

S. Zollner, department head, Ph.D. (Stuttgart)-experimental condensed matter and applied physics; V. Papavassiliou, graduate program coordinator, Ph.D. (Yale)-nuclear and particle physics; R. L. Armstrong, Ph.D. (Johns Hopkins)-optics and laser physics; C. W. Bruce, Ph.D. (New Mexico State)-applied optics; M. Burkardt, Ph.D. (Erlangen)- theoretical nuclear and particle physics; M. DeAntonio, Ph.D. (New Mexico State)- applied optics; M. Engelhardt, Ph.D. (Erlangen) — computational nuclear and particle physics; W. R. Gibbs, Ph.D. (Rice)-theoretical nuclear physics; G. H. Goedecke, Ph.D. (Rensselaer)-theoretical physics, optics; T. M. Hearn, Ph.D. (Cal Tech)-seismic tomography, seismology; Stephen Kanim, Ph.D. (University of Washington) Physics Education; B. Kiefer, Ph.D. (Michigan) - computational condensed matter physics, mineral physics; G. S. Kyle, Ph.D. (Minnesota)-nuclear and particle physics; H. Nakotte, Ph.D. (Amsterdam)-materials science, neutron scattering; J. Neakrase Ph.D. (Arizona State) Physics Education; J. Ni, Ph.D. (Cornell)- geophysics, seismology; S. F. Pate, Ph.D. (Pennsylvania)-nuclear and particle physics; J. Urquidí, Ph.D. (Texas Tech) - materials science, neutron and X-ray scattering; I. Vasiliev, Ph.D. (Minnesota)- computational materials science.

DEGREE: Master of Science
MAJOR: Physics

DEGREE: Doctor of Philosophy
MAJOR: Physics

MINOR: Physics

The Department of Physics offers programs in many areas of emphasis leading to the M.S. and Ph.D. degrees. Admission to these programs is based on undergraduate and/or previous graduate grade-point averages, performance on the Graduate Record Examination, and references.

All degree-seeking graduate students must satisfy the relevant Graduate School requirements, pass a qualifying examination based on undergraduate physics courses at the 400 level, successfully complete a 500-level laboratory, and demonstrate or develop knowledge of computer programming.

For the master's degree, students must also successfully complete or transfer at least 30 course credits and pass a final oral examination or the doctoral comprehensive examination. Of these 30 credits, at least 21 must be in physics/geophysics, at most 3 may be for individual study or other informal courses, at most 6 may be for a thesis, and at most 9 may be numbered between 450 and 499. A master's thesis is optional.

For the Ph.D. degree, students must also pass the doctoral comprehensive examination, carry out original research, complete a dissertation, and pass a final oral examination. They must also pass or transfer at least 36 credits in formal courses numbered above 500 in physics/geophysics, including 24 credits of core graduate courses, and complete at least 6 credits of formal courses numbered above 600. The total number of credits, including formal and informal course credits and a minimum of 18 dissertation credits, must be at least 72. Financial support is available to graduate students in physics through teaching and research assistantships and fellowships. Inquiries about these opportunities should be directed to the head of the department.

Students may choose areas of emphasis from a variety of experimental, theoretical, and computational research programs in the department. The current major research areas of the department include atmospheric physics, condensed matter physics/materials science, geophysics, optics, particle and nuclear physics, physics education, and others. These research projects are supported by multimillion-dollar funding by various federal agencies and two national laboratories within the state of New Mexico: Los Alamos National Laboratory and Sandia National Laboratories. In addition to the in-house research, the department conducts collaborative research programs with the Brookhaven National Laboratory, the Center for Integrated NanoTechnologies, Los Alamos National Laboratory, Sandia National Laboratories, the Thomas Jefferson Laboratory, Fermilab, and other national and international laboratories.

The department is housed in a newly- renovated building which contains research laboratories, classrooms, offices, and a computational laboratory..

PHYSICS

- PHYS 450. Selected Topics** 1-3 cr.
Readings, lectures or laboratory studies in selected areas of physics. May be repeated for a maximum of 12 credits.
- PHYS 451. Intermediate Mechanics I** 3 cr.
Vector calculus, Lagrangian and Hamiltonian formulations of Newtonian mechanics. Topics include central force motion, dynamics of rockets and space vehicles, rigid body motion, noninertial reference frames, oscillating systems, relativistic mechanics, classical scattering, and fluid mechanics. Prerequisite: PHYS 213 or PHYS 215G, and MATH 291G. Corequisite: MATH 392.
- PHYS 452. Intermediate Mechanics II** 3 cr.
Continuation of topics in PHYS 451. Prerequisites: PHYS 451.
- PHYS 454. Intermediate Modern Physics I** 3 cr.
Introduction to quantum mechanics, with applications to atoms, molecules, solids, and nuclei. Topics include atomic and molecular spectra and selection rules, X-rays, quantum statistics, lasers, superconductivity, electrical conductivity, magnetism, nuclear models and reactions, radioactivity, elementary particles. Prerequisites: MATH 392 and PHYS 315.
- PHYS 455. Intermediate Modern Physics II** 3 cr.
Continuation of topics in PHYS 454. Prerequisites: PHYS 454.
- PHYS 461. Intermediate Electricity and Magnetism I** 3 cr.
Covers electro-and magneto-statics, dielectric and magnetic materials, DC and AC circuits, electromagnetic wave propagation, reflection, refraction, waveguides, radiating systems, interference and diffraction, Newtonian and relativistic electrodynamics, magnetohydrodynamics and plasma physics. Prerequisite: PHYS 214 or PHYS 216G or equivalent, and MATH 291G.
- PHYS 462. Intermediate Electricity and Magnetism II** 3 cr.
Continuation of topics in PHYS 461. Prerequisites: PHYS 461.
- PHYS 470. Physical Optics** 3 cr.
Interference and diffraction, spectroscopic instrumentation, coherence, laser and Gaussian laser beam, and elements of nonlinear optics and fiber optics. Prerequisites: PHYS 370; and PHYS 214, PHYS 216G, or PHYS 217. Same as E E 470.
- PHYS 471. Modern Experimental Optics** 2 cr. (6P)
Advanced laboratory experiments in optics related to the material presented in PHYS 470. Prerequisite/corequisite: PHYS 470. Same as E E 481.
- PHYS 472. Non-Linear Optical and Laser Physics** 3 cr.
An introduction to the physics of non-linear optical processes primarily involving the interaction of intense laser radiation with matter. Topics include elements of laser physics, harmonic generation, stimulated Rayleigh, Raman, and Brillouin scattering, self-focusing and optical phase conjugation.
- PHYS 473. Introduction to Optics** 3 cr.
The nature of light, Geometrical optics, basic optical instruments, wave optics, aberrations, polarization, and diffraction. Elements of optical radiometry, lasers and fiber optics. Prerequisite(s): PHYS 216 or PHYS 217. Crosslisted with: E E 473
- PHYS 475. Advanced Physics Laboratory** 0-3 cr.
Advanced undergraduate laboratory involving experiments in atomic, molecular, nuclear, and condensed-matter physics. Prerequisite: PHYS 315 and 315L
- PHYS 476. Computational Physics** 3 cr.
An introduction to finite difference methods, Fourier expansions, Fourier integrals, solution of differential equations, Monte Carlo calculations, and application to advanced physics problems. Prerequisites: MATH 392.
- PHYS 477. Fiber Optic Communication Systems** 4 cr. (3+3P)
See E E 477 Prerequisite(s): C or better in E E 315 or PHYS 461. Crosslisted with: E E 477
- PHYS 478. Optical Sources, Detectors, and Radiometry** 4 cr. (3+3P)
See E E 478. Prerequisite(s): PHYS 217. Crosslisted with: E E 478
- PHYS 479. Lasers and Applications** 4 cr. (3+3P)
See E E 479 Prerequisite(s): C or better in E E 315 or in PHYS 461. Crosslisted with: E E 479
- PHYS 480. Thermodynamics** 3 cr.
Thermodynamics and statistical mechanics. Basic concepts of temperature, heat, entropy, equilibrium, reversible and irreversible processes. Applications to solids, liquids, and gases. Prerequisites: PHYS 217, PHYS 315 and MATH 291G.
- PHYS 485. Independent Study** 1-3 cr.
Individual analytical or laboratory studies directed by a faculty member. Prerequisite: consent of instructor. May be repeated for a maximum of 6 credits.
- PHYS 488. Condensed Matter Physics** 3 cr.
Crystal structure, X-ray diffraction, energy band theory, phonons, cohesive energy, conductivities, specific heats, p-n junctions, defects, surfaces, and magnetic, optical, and low-temperature properties. Prerequisite: PHYS 315.
- PHYS 489. Introduction to Modern Materials** 3 cr.
Structure and mechanical, thermal, electric, and magnetic properties of materials. Modern experimental techniques for the study of material properties. Prerequisite: PHYS 315.
- PHYS 490. Nuclei and Elementary Particles** 3 cr.
Introduction to nuclei, nuclear reactions, and elementary particles, with applications to astronomy and astrophysics. May include nucleosynthesis, thermonuclear reactions, the major burning phases in stars, and the weak interaction in astrophysics. Prerequisites: PHYS 454.
- PHYS 491. High Energy Physics I** 3 cr.
Particle detectors, accelerators, and experimental techniques. Fundamental particles and interactions. Symmetries in particle physics. Quark model of hadrons. Electroweak theory. Strong interactions and QCD. Nuclear interactions at high energies. Grand unification. Super symmetry. Prerequisite: PHYS 454.
- PHYS 492. High Energy Physics II** 3 cr.
Continuation of topics in PHYS 491. Prerequisite: PHYS 491.
- PHYS 493. Experimental Nuclear Physics** 3 cr. (1+6P)
Selected experimental investigations in nuclear physics such as measurement of radioactivity, absorption of radiation, nuclear spectrometry. Prerequisite: PHYS 315.
- PHYS 495. Mathematical Methods of Physics I** 3 cr.
Applications of mathematics to experimental and theoretical physics. Topics selected from: complex variables; special functions; numerical analysis; Fourier series and transforms, Laplace transforms. Prerequisite: MATH 392.
- PHYS 496. Mathematical Methods of Physics II** 3 cr.
Applications of mathematics to experimental and theoretical physics. Topics selected from: vector spaces; group theory in quantum mechanics; probability and error analysis; partial differential equations. Prerequisite: PHYS 495.
- PHYS 500. Special Topics Seminar** 1-2 cr.
Treatment of topics not covered by regular courses. Graded S/U. May be repeated.
- PHYS 508. Physics for Educators** 3 cr.
Assists K-12 teachers in developing pedagogy in physics. Addresses New Mexico benchmarks and standards.
- PHYS 511. Mathematical Methods of Physics I** 3 cr.
Same as PHYS 495. Additional work required at a more advanced level.
- PHYS 520. Selected Topics** 1-3 cr.
Formal treatment of graduate-level topics not covered in regular courses. Prerequisites: graduate standing, consent of instructor, and selection of a specific topic prior to registration. May be repeated for a maximum of 9 credits.
- PHYS 521. Individual Study** 1-3 cr.
Individual analytical or laboratory studies directed by a faculty member. Prerequisites: graduate standing, consent of instructor, and selection of a specific topic prior to registration. May be repeated for a maximum of 6 credits.
- PHYS 527. Fiber Optic Communication Systems** 4 cr. (3+3P)
Same as E E 527 Crosslisted with: E E 527
- PHYS 528. Optical Sources, Detectors, and Radiometry** 4 cr. (3+3P)
Same as E E 528 Crosslisted with: E E 528
- PHYS 529. Lasers and Applications** 4 cr. (3+3P)
Same as E E 529 Crosslisted with: E E 529
- PHYS 551. Classical Mechanics** 3 cr.
Lagrangian and Hamiltonian formulation of dynamics. Advanced treatments of most topics listed under PHYS 451, 452, plus canonical transformations and Hamilton-Jacobi theory. PHYS 451 and PHYS 452 strongly recommended.
- PHYS 554. Quantum Mechanics I** 3 cr.
Wave function, indeterminacy, classical limit. Schrodinger equation. Atomic and nuclear systems. Angular momentum, intrinsic spin, identical particles. Scattering theory. Mathematical formalism, symmetry and conserved quantities. Perturbation theory. Dirac theory, introduction to quantized fields. PHYS 452, PHYS 454, and PHYS 456 strongly recommended.
- PHYS 555. Quantum Mechanics II** 3 cr.
Continuation of topics in PHYS 554. Prerequisites: PHYS 554 or consent of instructor.
- PHYS 561. Electromagnetic Theory I** 3 cr.
Detailed advanced treatments of most topics listed under PHYS 461, PHYS 462, plus multipole radiation, collisions of charged particles and

- bremsstrahlung, scattering, and radiation reaction. PHYS 461 and PHYS 462 strongly recommended.
- PHYS 562. Electromagnetic Theory II 3 cr.
Continuation of topics in PHYS 561. Prerequisites: PHYS 561 or consent of instructor.
- PHYS 570. Advanced Physical Optics 3 cr.
Taught with PHYS 470 with additional work required at the graduate level. Recommended preparation is E E 370 or PHYS 370 or equivalent. Cross-listed with: E E 570
- PHYS 571. Advanced Experimental Optics 2 cr.
Taught with PHYS 471 with additional work required at the graduate level. Consent of instructor required. Corequisite(s): PHYS 570.
- PHYS 572. Advanced Nonlinear Optical and Laser Physics 3 cr.
Same as PHYS 472 with differentiated assignments for graduate students.
- PHYS 575. Advanced Physics Laboratory 0-3 cr.
Selected experiments in atomic, molecular, nuclear and condensed-matter physics.
- PHYS 576. Advanced Computational Physics I 3 cr.
Advanced treatment of topics listed under PHYS 476, plus additional required work. Applications of numerical methods to complex physical systems. Recommended knowledge of Fortran or C, and MATH 377 or MATH 392. Same as PHYS 476, but additional work required.
- PHYS 577. Fourier Methods in Electro-Optics 3 cr.
Same as E E 577 Crosslisted with: E E 577
- PHYS 578. Optical System Design 3 cr.
See E E 578. Crosslisted with: E E 578
- PHYS 580. Laser Detection Techniques 3 cr.
Fundamentals of laser detection. Laser radar sensing (LIDAR), laser induced fluorescence, raman scattering, opto-galvanic spectroscopy, opto-acoustic spectroscopy, and other common laser detection techniques. Recommended preparation is PHYS 478 and PHYS 479 or equivalent.
- PHYS 584. Statistical Mechanics 3 cr.
Thermodynamics review. Probability, entropy, equilibrium. Canonical and grand canonical ensembles. Classical and quantum statistics. Degenerate and classical gases. Application to the equilibrium properties of solids, liquids, and gases. Kinetic theory and transport processes. PHYS 452, PHYS 454, and PHYS 455 strongly recommended.
- PHYS 586. Nonlinear Dynamics I 3 cr.
Introduction to nonlinear dynamics and deterministic chaos. Typical topics include stability and bifurcations; chaos in one dimensional maps; universality and renormalization group; symbolic dynamics; fractals; sensitive dependence on initial conditions; self-organization and complexity; time series analysis; cellular automata and computer experiments. Knowledge of differential equations and linear algebra is desired. Prerequisite: familiarity with ordinary differential equations and linear algebra. Same as MATH 586.
- PHYS 588. Advanced Condensed Matter Physics 3 cr.
Same as PHYS 488, but additional work required. Prerequisite: PHYS 554 or consent of instructor.
- PHYS 589. Modern Materials 3 cr.
Same as PHYS 489 with differentiated assignments for graduate students. Prerequisite: PHYS 554 or consent of instructor.
- PHYS 591. Advanced High-Energy Physics I 3 cr.
Same as PHYS 491 with additional work for graduate students. Prerequisite: PHYS 554 or consent of instructor.
- PHYS 592. Advanced High-Energy Physics II 3 cr.
Same as PHYS 492 with additional work for graduate students.
- PHYS 599. Master's Thesis 0-88 cr.
Thesis.
- PHYS 600. Research 1-88 cr.
Doctoral research. May be repeated.
- PHYS 620. Advanced Topics in Physics 1-3 cr.
Advanced formal treatment of topics not covered in regular courses. Prerequisite: consent of instructor. May be repeated for a maximum of 9 credits.
- PHYS 649. Application of Tensor Analysis 3 cr.
Introduction to tensor analysis, Gaussian differential geometry, and Riemannian geometry. Working knowledge of vector methods is assumed and numerous physical applications in electrodynamics and special relativity are included. Course is intended to cover the tensor-theoretic preliminaries for PHYS 650. Prerequisite: PHYS 651. Same as MATH 649.
- PHYS 650. General Relativity I 3 cr.
Basic foundations and principles of general relativity, derivation of the Einstein field equations and their consequences, the linearized theory, the Bel-Petrov classification of the curvature tensor, derivation of the Schwarzschild solution and the four basic tests of general relativity. Prerequisite: PHYS 649.
- PHYS 651. General Relativity II 3 cr.
Elementary theory of degenerate stars; physics of gravitational collapse; derivations of the axially symmetric solutions of Weyl, Kerr, and Vaidya; Penrose process and Hawkins's area theorem; no hair theorem; Penrose's evidence for black holes. Prerequisite: PHYS 650.
- PHYS 652. General Relativity III 3 cr.
Basic properties of the standard model of Friedmann-Lemaître-Robertson-Walker; the Einstein, DeSitter, Einstein-DeSitter models; group-theoretic method in relativistic cosmology including derivations of the standard model, and the Gödel model; the inflation paradigm; the problem of dark matter; and observational cosmology. Prerequisite: PHYS 651.
- PHYS 676. Advanced computational Physics II 3 cr.
Continuation of the advanced computational techniques presented in PHYS 576 with special emphasis on numerical descriptions of quantum systems. Topics include two-body scattering, bound states, time-dependent systems, and scattering of a projectile from a many-body system. Methods for the solution of several-body problems include Monte Carlo Green's function techniques. Prerequisites: PHYS 555, PHYS 576, or consent of instructor.
- PHYS 680. Independent Study 1-3 cr.
Individual analytical or laboratory studies directed by a faculty member. Prerequisite: graduate standing or consent of instructor. May be repeated for a maximum of 6 credits.
- PHYS 689. Advanced Modern Materials 3 cr.
Advanced topics in the physics of modern materials, such as crystalline, amorphous, polymeric, nanocrystalline, layered, and composite materials and their surfaces and interfaces. Prerequisites: PHYS 555, PHYS 588, or consent of instructor.
- PHYS 691. Quantum Field Theory I 3 cr.
Path integrals, gauge invariance, relativistic quantum mechanics, canonical quantization, relativistic quantum field theory, introduction to QED. Prerequisites: PHYS 555 and PHYS 562, or consent of instructor.
- PHYS 692. Quantum Field Theory II 3 cr.
QED, running coupling constant, QCD, electroweak theory, asymptotic freedom, deep inelastic scattering, basic QCD phenomenology, path integrals in quantum field theory, lattice QCD. Prerequisite: PHYS 691 or consent of instructor.
- PHYS 700. Doctoral Dissertation 0-88 cr.
Dissertation.

GEOPHYSICS

- GPHY 450. Selected Topics 1-3 cr.
Readings, discussions, lectures or laboratory studies of selected areas of geophysics. Prerequisite: consent of instructor. May be repeated for a maximum of 12 credits.
- GPHY 500. Special Topics Seminar 1-2 cr.
Supervised study of selected topics not covered by regular courses.
- GPHY 510. Geophysical Field Methods 1-3 cr. (3+9P)
Field collection, reduction, and interpretation of geophysical data; equipment operation. Prerequisite: GPHY 452 or equivalent.
- GPHY 520. Selected Topics 1-3 cr.
Formal treatment of graduate topics not covered in regular courses. Prerequisites: graduate standing, consent of instructor, and selection of a specific topic prior to registration. May be repeated for unlimited credit.
- GPHY 530. Seismology 3 cr.
Seismic wave propagation in a layered earth, ray theory, exploration techniques, earth structure, and seismicity. Prerequisites: PHYS 511, MATH 472, or equivalent.
- GPHY 540. Physics of the Earth and Planetary Interiors 3 cr.
Formation and evolution of the Earth and planets. Internal physical and chemical structure. Pressure and temperature effects on rocks. Equations of state. Physical mechanisms of plate tectonics. Physics of the Earth's core, planetary magnetism, geodynamo. Prerequisites: consent of instructor.
- GPHY 560. Applied Inverse Theory 3 cr.
Inversion of data with an emphasis on geophysical problems. Curve fitting, tomography, earthquake location, overdetermined and underdetermined problems, linear and nonlinear problems. Prerequisite: either MATH 280, equivalent, or consent of instructor. Computing experience desirable. Same as PHYS 560.
- GPHY 598. Special Research Problems 1-3 cr.
Individual investigations, either analytical or experimental. May be

repeated for unlimited credit.	
GPHY 599. Master's Thesis	0-88 cr.
Thesis.	
GPHY 620. Advanced Topics in Geophysics	3 cr.
Advanced formal treatment of a topic or topics not covered in regular courses. Prerequisite: consent of instructor. May be repeated for unlimited credit.	
GPHY 621. Special Topics Seminar	1-3 cr.
Seminar treatments of advanced special topics in geophysics. Prerequisite: consent of instructor. May be repeated for unlimited credit.	
GPHY 630. Theoretical Seismology I	3 cr.
Advanced treatment of wave propagation, ray theory, inversion methods, extension to heterogeneous media, and free oscillations. Prerequisites: GPHY 530 and PHYS 512.	
GPHY 700. Doctoral Dissertation	0-88 cr.
Dissertation.	

PSYCHOLOGY

Department website: <http://www-psych.nmsu.edu/>
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domsimon@nmsu.edu

D.A. Simon, department head, Ph.D. (Californial - Los Angeles) J. R. Cowie, Ph.D. (Strathclyde University, Glasgow, Scotland) - automatic language processing, psycholinguistics; I. Dolgov, Ph.D. (Arizona State University)- perception and action, natural user interfaces, embodied cognition, human factors; M. J. Guynn, Ph.D. (New Mexico) - human memory; T. Ketelaar, Ph.D. (Michigan)-social psychology, emotion; J. K. Kroger, Ph.D. (California-Los Angeles) - biopsychology, cognitive neuropsychology; J. MacDonald (Purdue) – engineering psychology, auditory perception; J. E. McDonald, Ph.D. (New Mexico State University)- cognitive psychology, engineering psychology; L.J. Madson, Ph.D. (Iowa State) – scholarship of teaching & learning, gender, sexuality; M.J. Marks, Ph.D. (Illinois, Urbana- Champaign) social psychology, sexual behaviors, relationships; S. Rice, Ph.D. (Illinois, Urbana-Champaign) – engineering psychology, applied cognition; D. A. Simon, Ph.D. (California-Los Angeles) - cognition, learning and performance; L.A. Thompson, Ph.D.(California-Santa Cruz) -developmental psychology, cognitive psychology; D.Trafimow, Ph.D. (Illinois, Urbana-Champaign) - social cognition.

Support Faculty: P. Foltz, Ph.D. (Colorado) - cognition, human-computer interaction; D. Gillan (Texas) – human-computer interaction, perception; D. Hunt (Emeritus) Ph.D. (Ohio State) – human factors; V. S. Johnston (Emeritus), Ph.D. (Edinburgh) - biopsychology, comparative, psychopharmacology, neuropsychology; A. Y. Lee, Ph.D.(Colorado) - cognition, learning, human-computer interaction; W. C. Ogden, Ph.D. (New Mexico State) - human computer interaction, natural language processing; K. Paap (Emeritus) Ph.D. (Wisconsin) – psycholinguistics; R. Schvaneveldt (Emeritus) Ph.D. (Wisconsin) engineering psychology, aviation; W. Stephan (Emeritus) Ph.D. (Minnesota) – stereotyping and prejudice, cross-cultural psychology.

DEGREE: Master of Arts
MAJOR: Psychology

DEGREE: Doctor of Philosophy
MAJOR: Psychology

MINOR: Psychology

ADMISSION

The Department of Psychology offers graduate work leading to the Master of Arts and Doctor of Philosophy degrees. To maximize consideration for admittance, candidates should submit applications by February 1.

Students will be admitted to graduate study on the basis of their potential for achievement in research, scholarship, and teaching. The most promising applicants will be accepted. Because the number of students that the department can successfully accommodate is limited, it will not always be possible to admit all qualified applicants. The admissions committee will consider any material that a candidate for admission wishes to present. The minimum application consists of the following (with minimum acceptable values):

1. A completed Graduate School admission application (the last page of this catalog).
2. Complete transcripts of all college work (minimum 3.0 GPA).
3. Scores on the General Graduate Record Examination Applicants to the MA program are most likely to be accepted with minimum scores of 500 (Verbal), 600 (Quantitative), and 4.5 (Analytical writing). Applicants to the PhD program are most likely to be accepted with minimum scores of 560 (Verbal), 720 (Quantitative), and 5.0 (Analytical writing). Scores on the GRE Psychology test are not required.
4. Three letters of recommendation from professors, employers, or others qualified to evaluate your potential for graduate work.
5. A letter explaining how graduate work at NMSU fits your educational and career goals, and, if possible, an indication of the faculty members whose work is of particular interest to you.

Items 1-3 should be submitted to the Graduate School, items 4-5 to the Department of Psychology.

Students with bachelor degrees should apply for admittance to the master's program even if their eventual goal is a Ph.D. Students who earn their M. A. at New Mexico State University will be automatically considered for admission to the doctoral program after the oral defense of their thesis. Following a recommendation from the student's committee, admission is determined by a vote of the entire faculty.

Admission of students with a Master of Arts degree from other institutions is determined by the department's Graduate Committee. Admission to the doctoral program is frequently made conditional upon one or more of the following: completion of a research thesis, completion of either course work or qualifying exams in three of the core course areas; and completion of either course work or qualifying exams in masters-level quantitative methods.

A number of potential minors are available to interested students, including a minor in statistics. Additional information about a minor may be found in the listing of the home department in this catalog

DEGREE: Master of Arts
MAJOR: Psychology

The department offers an M.A. degree in general experimental psychology. Students are required to: (1) complete a first-year research project; (2) complete three of the eight core courses (perception, learning, biopsychology, cognitive neuroscience, cognitive, developmental, engineering or human performance, and social); (3) take three required courses in quantitative skills; and (4) complete a research thesis. The program provides students with sufficient electives to emphasize a particular subarea of experimental psychology. The program is designed to provide graduates with the tools and knowledge necessary for further training at the doctoral level or for employment in industry or government. Students may also pursue a (non- thesis) MA in Experimental Psychology. Details may be viewed at www.psych.nmsu.edu.

DEGREE: Doctor of Philosophy
MAJOR: Psychology

The Ph.D. in psychology is offered in the major areas of cognitive, engineering, and social psychology. Ph.D. candidates are required to: (1) complete four of the nine core courses (preception, learning, biopsychology, cognitive neuroscience, history and systems, engineering or human performance, cognitive, developmental, and social), at least one which must be the basic course from one of our three programs, viz. cognitive, engineering, or psychology; (2) complete three required courses in quantitative skills, plus a minimum of 6 additional credits in methods/ statistics; (3) pass comprehensive written and oral exams in their area (cognitive, engineering, or social); and (4) pass a final oral examination that consists primarily of an evaluation of the dissertation and the candidate's defense of it, but may extend over the entire field of the candidate's study. For the Ph.D. degree in Engineering psychology, students must complete an internship in an industrial, government, or other laboratory setting of at least three-months duration.

PSYCHOLOGY

PSY 450. Senior Thesis	3 cr.
A laboratory or field research project conducted under faculty supervision. Requires written research proposal, conduct of research, data analysis, and final written report. Prerequisites: PSY 310, 6 additional psychology credits, consent of supervising faculty member, and junior or above standing. May be repeated for a maximum of 6 credits.	

PSY 470. Special Topics	1-3 cr.
Specific subjects to be announced in the Schedule of Classes. May be repeated for a maximum of 12 credits.	
PSY 501. Introduction to Psycholinguistics	3 cr.
Introduction to graduate studies in psycholinguistics. Psychological aspects of language; linguistic theories of grammar, psychological factors influencing language performance, primary language acquisition and the relationship of language to thought processes. Same as LING 501.	
PSY 507. Quantitative Methods in Psychology I	3 cr.
Statistical concepts emphasizing distributions and methods most appropriate to the data, models, and theories in psychology. Prerequisite: An elementary statistics course or consent of instructor.	
PSY 508. Quantitative Methods in Psychology II	3 cr.
Statistical concepts emphasizing distributions and methods most appropriate to the data, models, and theories in psychology. Prerequisite: PSY 507 or equivalent.	
PSY 509. Quantitative Methods in Psychology III	3 cr.
Statistical concepts emphasizing distributions and methods most appropriate to the data, models in psychology. Prerequisite: PSY 507 or equivalent.	
PSY 510. Computer Methodology	3 cr.
Use of computers in psychological research with emphasis on developing experimental control programs.	
PSY 520. Learning	3 cr.
Classical areas of learning, including instrumental and classical conditioning paradigms, habituation, reinforcement variables, stimulus generalization and transfer, and memory.	
PSY 522. Sensation and Perception	3 cr.
Stimulus and decision variables in judging auditory and visual events. Topics include: detection of signals; signal intensity versus perceived strength; size, shape, and movement perception; reading and listening.	
PSY 523. Methods in Cognitive Psychology	3 cr.
Experimental and correlational methodologies appropriate for investigating cognitive psychological theories and problems. Prerequisite(s): PSY 524 or consent of instructor.	
PSY 524. Cognitive Psychology	3 cr.
Examines theoretical and empirical work on human cognition. Topics include: information processing theories, pattern recognition, memory, attention, language, problem solving, decision making, and reasoning.	
PSY 525. Biopsychology	3 cr.
The biological basis of behavior with an emphasis on human cognitive functioning.	
PSY 527. Social Psychology	3 cr.
Current and traditional theories, research findings, and research methodologies of social psychology.	
PSY 529. Methods in Social Psychology	3 cr.
Experimental, quasi-experimental, and correlational methodologies appropriate for investigating social psychological theories and problems. Prerequisite(s): Graduate student in psychology or consent of instructor.	
PSY 530. Human-Computer Interaction	3 cr.
Issues associated with human-computer interface design. Concepts, methods, and data from HCI, cognitive psychology, human factors, artificial intelligence, and psycholinguistics that apply.	
PSY 531. Human Memory	3 cr.
Current and traditional theories and research findings related to human memory.	
PSY 535. Developmental Psychology	3 cr.
Examines theoretical and empirical work in lifespan developmental psychology, with an emphasis on perceptual and cognitive development, language development, and social cognitive development.	
PSY 540. History and Systems of Psychology	3 cr.
History of scientific method emphasizing outstanding methodological problems of contemporary science, especially psychology. Covers recent history of psychology and development of schools of psychology.	
PSY 543. Cognitive Neuroscience	3 cr.
Introduction to the study of the neural mechanisms underlying cognitive processes. Topics include relations between neural processes and attention, perception, memory, thinking and language; measuring change in electrical activity, blood flow, and metabolism in the brain during cognition; the problem of consciousness; and evolutionary perspectives.	
PSY 547. Engineering Psychology	3 cr.
Covers concepts, methods, and findings of human performance. Treats the human as a subsystem that receives, stores and processes information, makes decisions, and acts within a human-machine environment system.	
PSY 548. Methods in Engineering Psychology	3 cr.
Engineering psychology methods such as task analysis, cognitive task	

analysis, user testing, prototyping, protocol analysis, cost-benefit analysis, safety and reliability analysis, and multivariate techniques. Prerequisite: PSY 547 or consent of instructor.

PSY 570. Special Topics	1-3 cr.
Specific subjects to be announced in the Schedule of Classes.	
PSY 598. Special Research Programs	1-3 cr.
Individual investigations either analytical or experimental. May be repeated for credit.	
PSY 599. Master's Thesis	0-88 cr.
Thesis.	
PSY 600. Doctoral Research	1-88 cr.
This course number is used for assigning credit for research performed prior to successful completion of the doctoral qualifying examination.	
PSY 625. Seminar in Cognitive Science	3 cr.
May be repeated with consent of instructor. May be repeated for unlimited credit.	
PSY 698. Special Research Programs	1-3 cr.
Individual investigations either analytical or experimental. May be repeated for credit.	
PSY 700. Doctoral Dissertation	0-88 cr.
Dissertation.	

SOCIOLOGY

Department website: <http://www.artsci.nmsu.edu/sociology/>
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Jim Maupin, Ph.D. (Arizona State University)- interim department head- juvenile justice, methods, policy & program evaluation; L. Hamilton, Ph.D. (Pennsylvania State)-rural sociology, community organization, social psychology; P. Hoffman, Ph.D. (University of Nebraska) – sociology of the family, environment and child well-being; K. Hovey, Ph.D. (University of New Mexico)- rural and urban communities, social control, criminological theory; C. A. Newby, Ph.D. (Texas-Austin)- race/ethnic/minority, relations; J. Steinkopf-Rice, Ph.D. (Washington State U.) gender, globalization, communities J.C. Rice, Ph.D. (Washington State U.) environment, society and technology, political sociology; S. Way, Ph.D. (University of Arizona)-sociology of education, gender, juvenile delinquency; K. Wosick, Ph.D. (UC, Irvine) sexuality, gender, family

DEGREE: Master of Arts
MAJOR: Sociology

MINOR: Sociology

While we offer a broad sociological curriculum, the Masters of Arts degree program in sociology has two natural areas of focus. Both have a strong socio-cultural emphasis based on strengths of the sociology faculty. Program focuses are:

THE SOUTHWEST AND BORDER REGION

Our unique location attracts faculty who are interested in peoples of the southwest, particularly Hispanics/Latinos and American Indians. In addition, our proximity to the U.S.-Mexico border provides an ideal laboratory for the examination of such issues as globalization, transnational migration and the consequences of border development.

SOCIAL INEQUALITY

Our faculty members examine the intersection of race, class and gender oppression in their teaching and research, with special attention to educational, rural/urban, ecological and global disparities. One goal of this examination is to address social problems such as poverty and racial/ethnic inequality.

The program is designed to prepare students for doctoral study in sociology and for employment in research and applied areas of the field. In addition to the on-campus program, we offer an online MA for students who are geographically distant from the NMSU main campus or who have full time jobs. Through small seminars, on campus graduate students engage in discussions of subjects that often result in thesis and internship topics. Regardless of course format, faculty members and students work toward the mutual goal of developing each student's full potential.

Students seeking a master's degree in sociology should have taken one undergraduate course each in methods and statistics or their equivalent. Students who have not taken these courses should complete them before beginning their graduate study in sociology in consultation with an academic advisor.

PROGRAM OPTIONS AND REQUIREMENTS

Graduate students in sociology have two program options, thesis or non-thesis. Faculty consider the student's special interests and career plans in advising regarding their choice of program options. The thesis option is typically selected by students who intend to pursue a Ph.D. degree, while the non-thesis option is commonly pursued by those desiring immediate employment in research and applied areas in government, education, social welfare and health. The non-thesis, coursework only option is currently the only option available for on-line MA students. All students must pass a final master's examination.

Thesis Program Requirements

In addition to the successful completion of an acceptable master's thesis, students who choose this option will take a minimum of 37 credit hours of graduate work distributed as follows:

- SOC 501, SOC 551, SOC 552, SOC 553 (10 credits total), to be taken within the first 18 hours of graduate credit. A grade of B or better is required to receive credit for each of these core courses.
- SOC 599 (6 credits) Thesis
- 21 credits of additional graduate course work to be taken in consultation with the sociology graduate student's advisor. Twelve of these 21 credits must be in 500 level Sociology courses.
- Final master's oral examination covering all general coursework and the thesis.

Non-Thesis Program Requirements: Internship

In addition to the successful completion of an internship and internship report, students who choose this option will take a minimum of 37 credit hours of graduate work distributed as follows:

- SOC 501, SOC 551, SOC 552, SOC 553 (10 credits total), to be taken within the first 18 hours of graduate credit. A grade of B or better is required to receive credit for each of these core courses.
- SOC 596 (6 credits) Internship
- 21 credits of additional graduate course work to be taken in consultation with the sociology graduate student's advisor. Twelve of these 21 credits must be in 500 level Sociology courses.
- Final master's oral examination covering all general coursework and the internship.

Non-Thesis Program Requirements: Coursework Only

Students who choose this option will take a minimum of 37 credit hours of graduate work distributed as follows:

- SOC 501, SOC 551, SOC 552, SOC 553 (10 credits total), to be taken within the first 18 hours of graduate credit. A grade of B or better is required to receive credit for each of these core courses. The one credit SOC 501 requirement is waived for online students.
- 27 credits of additional graduate course work to be taken in consultation with the sociology graduate student's advisor. Eighteen of these 27 credits must be in 500 level Sociology courses.
- Final master's written examination covering all general coursework. In some cases, with the permission of the director of graduate studies, on-campus students may complete a special research project that will include a final master's oral examination covering all general coursework and the research project.

Admission Requirements

To apply for admission to the Sociology MA Program, submit the following:

- Application form and fees (send to the Graduate School)
- Official undergraduate and graduate transcripts from all colleges and universities attended (send to the Graduate School)
- Department Application Form (send to the department)
- A letter from the candidate addressing her or his interests and graduate school objectives (send to the department)
- Letters of recommendation from three persons familiar with candidate's academic record (send to the department)

An undergraduate grade-point average of 3.0 or higher is strongly recommended. Department application and recommendation forms can be found on

the program web page, <http://www.artsci.nmsu.edu/sociology/>. On-campus applicants wishing to apply for a graduate assistantship should apply by February 15 for fall and October 15 for spring. Note: Fall admission only for on-line MA program applicants.

SOCIOLOGY

- SOC 449 H. Directed Readings Honors 1-3 cr.
Same as SOC 449. Additional work to be arranged. Prerequisite: consent of instructor. May be repeated for a maximum of 6 credits.
- SOC 450. Qualitative Research Methods 3 cr.
This course will provide an in-depth examination of qualitative research methods, including participant observation techniques, interviewing, and content analysis. Prerequisites: SOC 352, COMM 305, GOVT 300, C J 300, PSY 310, PSY 355 or consent of instructor.
- SOC 451. Advanced Quantitative Techniques 3 cr.
Advanced methods of sociological analysis are examined in detail. Prerequisite(s): SOC 353 or equivalent or permission of instructor. Restricted to Sociology BA or MA or permission of instructor majors.
- SOC 452. Advanced Social Theory 3 cr.
Analysis of classical and contemporary theoretical perspectives within the discipline. Prerequisite(s): SOC 351. Restricted to BA Sociology MA Sociology majors.
- SOC 453. Advanced Research Methods 3 cr.
Exploration of research methods, issues, and practical applications. Builds upon foundation provided by SOC 352 or other junior-level social research courses. Prerequisite(s): One of the following: SOC 352, COMM 305, GOVT 300, C J 300, PSY 310, PSY 355 or consent of instructor. Restricted to BA - Sociology MA - Sociology majors.
- SOC 455. Advanced Social Research: Evaluation 3 cr.
Logic, design and ethics of evaluations including theory driven and multi level models. Emphasis on individual, group and community level needs assessment, process and activities assessment and outcomes assessment including social impact assessment. Data collection techniques will include survey questionnaire construction, interviewing, focus groups and case studies. Measures of efficiency and effectiveness will be examined. Prerequisite: Research Methods Course.
- SOC 456. Survey Research Methods 3 cr.
This course will provide an in-depth examination of survey research techniques, including telephone surveys, mail survey, internet surveys, and multi-modal techniques. The various aspects of questionnaire construction and administration of surveys will be covered. Prerequisites: COMM 305, GOVT 300, C J 300, PSY 355 or consent of instructor.
- SOC 457. Gender, Science, and Technology 3 cr.
How gender, science and technology are interrelated social constructions. Science and technology are examined as social institutions. Explanations for different rates of participation based on race, class and gender are explored. Same as: WS 467.
- SOC 458V. Comparative Global Family Systems 3 cr.
The study of families around the world. The comparison will include how capitalism and power differentials have affected the course of family history, gender relations, and family life today.
- SOC 459. Advanced Issues in Sex and Gender 3 cr.
Comprehensive examination of current gender identity and gender stratification issues. Same as W S 459.
- SOC 460. Sociology of Religion 3 cr.
Examination of religion in its social context to understand the intricate relations of religion, culture and U.S. society. Recommended preparatory courses: SOC 101G, SOC 273, SOC 376, ANTH 125G.
- SOC 461. Population Trends and Analysis 3 cr.
Overview of past, present, and future population phenomena and introduction to techniques of demographic analysis.
- SOC 465V. Environmental Sociology 3 cr.
Advanced examination of societal responses to environmental problems including social adjustments to natural and technological hazards, socio-cultural aspects of technological risk and impact assessment, and emergence of environmental social movements.
- SOC 466. Society and Technology 3 cr.
Examines the social dynamics shaping technological form and utilization as well as the impacts of technology and socio-technical systems upon society. Topics include: the historical role of technology in socio-cultural evolution, technology and contemporary social change, technological risks and risk management, technology and politics, and the contradictory effects of technology in contributing to and alleviating environmental degradation.
- SOC 467. Internship 1-6 cr.

- SOC 468. Global Sexualities 3 cr.
Generates a global context to focus on sexual identity and orientation, sexual identity politics, romantic relationships, patterns of sexual behavior, sexual regulation and the impact of different cultures on individual sexualities. Taught with SOC 568. Crosslisted with: W S 468
- SOC 470. Sociology of Latinos/as in the United States 3 cr.
In-depth examination and comparative analysis of political and economic issues affecting Latino/a culture and behavior. Includes the Chicano/a and larger Latino/a movements, the border, immigration, language policies, education, religion, labor, and Latina women's issues. Recommended preparatory courses: SOC 101G, SOC 270, SOC 371, or HIST 367.
- SOC 471. Advanced Race and Ethnic Relations 3 cr.
In-depth analysis of the dynamics of prejudice, discrimination, and patterns of intergroup interaction in the U.S.
- SOC 472. Sociology of Medical Ethics 3 cr.
Focus on ethics as applied in health care from a sociological perspective. Includes cultural issues and the decision making process, with individual and social implications. Same as SOC 572.
- SOC 474. Sociology of Organizations 3 cr.
Sociological models of formal organizations relevant to business, education, government, healthcare, military, and religion. Focus on internal organizational structure and dynamics plus the reciprocal relationship between organizations and their operating environment.
- SOC 475. Advanced Social Stratification 3 cr.
Theories of stratification and current methods of stratification research. Focus on differences by ethnicity, race, class, and gender.
- SOC 476. Social Institutions in Appalachia 3 cr.
Survey of social issues of Appalachia including the emergence and perpetuation of stereotypical images, the impact of the coal industry on the social environment, and consideration of religious, political, and social policy aspects.
- SOC 477. Sociology of Education 3 cr.
Socio-political and economic factors that shape the structure and operation of educational institutions in modern complex societies. Socio-historical development of the school as a microcosm of society, with examples from American and other school systems.
- SOC 478. Sociology of Development and the World System 3 cr.
A sociological approach to development and global system. Theories of development and underdevelopment; world poverty/inequality; Latin America, Africa, and Asia in comparative perspectives; transnational borders/U.S.-Mexico border; current topics. Same as GOVT 477.
- SOC 479. Sociology Perspectives on the U.S.-Mexico Border 3 cr.
Theoretical perspectives and current research on the U.S.-Mexico border region, including topics such as migration, identity, health, gender, and environment.
- SOC 480. Diversity in Alternative Families 3 cr.
Cross-cultural examination of diversity among and within families: analysis of family diversity includes consideration of the theoretical frameworks, ideological commitments, personal experiences, and methodological approaches to examine family life.
- SOC 481. Social Deviance 3 cr.
Theoretical approaches to the study of social deviance with emphasis on critical theories. Exploration of forms of deviance in society. Examination of social construction of deviance within mass media and systems of social control.
- SOC 482. Advanced Individual and Society 3 cr.
Examines reciprocal relationship between individual and society. Topics include socialization, social influence and persuasion, group structure and performance, altruism, aggression, interpersonal attraction, group cohesion and conformity, and inter-group conflict.
- SOC 483. Symbolic Interaction 3 cr.
Examination of the interaction of self and the social order including society as process, the negotiation of social order, identity as a social product, role taking and the situated self, the social construction of reality with an emphasis on phenomenology and ethnomethodology.
- SOC 489. Globalization 3 cr.
Analysis of the globalization process. Covers theories of globalization, the global economy, political globalization, global culture, transnational social movements, transnational migration and world labor market, global cities, and local-global linkages. Same as GOVT 469.
- SOC 491. Criminological Theory 3 cr.
Schools of thought, contrasting approaches, and contemporary efforts in theory construction relevant to adult and juvenile offenders.
- SOC 496. Internship 1-6 cr.
Supervised participation in an appropriate community setting. Prerequisite: consent of instructor. May be repeated for a maximum of 9 credits. Same as SOC 596.
- SOC 530. Advanced Social Movement Theory 3 cr.
Overview of key theories in past and present social movement research. Topics include a focus on rational or spontaneous choice theories, resource mobilization, and new social movement theories. Theoretical perspectives focus on analysis of case studies including women's movement, civil rights, and environmental movements.
- SOC 548. Graduate Special Topics 3 cr.
Specific subjects to be announced in the Schedule of Classes.
- SOC 549. Special Research Problems 1-3 cr.
Individual analytic or experimental investigations. May be repeated for a maximum of 6 credits. Prerequisite: consent of instructor.
- SOC 550. Qualitative Research Methods 3 cr.
This course will provide an in-depth examination of qualitative research methods, including participant observation techniques, interviewing, and content analysis.
- SOC 551. Issues in Advanced Quantitative Analysis 3 cr.
Advanced methods of sociological analysis are examined in detail. Prerequisite(s): SOC 353 or equivalent or permission of instructor. Restricted to Sociology MA majors.
- SOC 552. Seminar in Sociological Theory 3 cr.
Analysis of contemporary theoretical perspectives within the discipline. Restricted to MA Sociology majors.
- SOC 553. Seminar in Sociological Research 3 cr.
Exploration of research methods, issues, and practical application. Prerequisite(s): SOC 352 or equivalent. Restricted to MA Sociology majors.
- SOC 554. Multiple Methods Research 3 cr.
Builds upon basic skills of social research to design and implement a multiple methods study. Data collection, organization, and analysis involve both quantitative and qualitative approaches Prerequisite(s): SOC 551, SOC 553.
- SOC 555. Applied Evaluation 3 cr.
Logic, design and ethics of evaluations including theory driven and multi-level models. Emphasis on individual, group and community level needs assessment, process and activities assessment and outcomes assessment including social impact assessment. Data collection techniques will include survey questionnaire construction, interviewing, focus groups and case studies. Measures of efficiency and effectiveness will be examined. Prerequisite: Research Methods Course.
- SOC 556. Survey Research Methods 3 cr.
This course will provide an in-depth examination of survey research techniques, including telephone surveys, mail surveys, internet surveys, and multi-modal techniques. The various aspects of questionnaire construction and administration of surveys will be covered.
- SOC 557. Graduate Seminar in Gender, Science, and Technology 3 cr.
Graduate seminar that explores how gender, science, and technology are interrelated social constructions. Science and technology are examined as social institutions. Explanations for different rates of participation based on race, class, and gender are explored.
- SOC 558. Seminar: Sociology of the Family 3 cr.
The family in various societies; evolution of the American family.
- SOC 559. Graduate Seminar in Sex and Gender 3 cr.
Comprehensive examination of current gender identity and gender stratification issues. Same as W S 559.
- SOC 560. Advanced Sociology of Religion 3 cr.
Examination of religion in its social context to understand the intricate relations of religion, culture and U.S. society.
- SOC 565. Advanced Environmental Sociology 3 cr.
Advanced examination of societal responses to environmental problems including social adjustments to natural and technological hazards, socio-cultural aspects of technological risk and impact assessment, and emergence of environmental social movements.
- SOC 566. Ecology of Human Societies 3 cr.
Examines the social dimensions of natural resource use and degradation at both a domestic and a cross-national level.
- SOC 568. Global Sexualities 3 cr.
Generates a global context to focus on sexual identity and orientation, sexual identity politics, romantic relationships, patterns of sexual behavior, sexual regulation, and the impact of different cultures on individual sexualities. Crosslisted with: W S 567
- SOC 569. Advanced Issues in Sexualities 3 cr.
Various issues in sexualities are addressed through a wide range of theoretical and empirical sociological literatures that involve quantitative and qualitative data. Advanced examination of the ways in which sexuality is constituted in local, cultural and institutional environments.

SOC 570. Advanced Sociology of Latinos/as in the United States	3 cr.
In-depth examination and comparative analysis of political and economic issues affecting Latino/a culture and behavior. Topics include the Chicano/a and larger Latina/o movements, the border, immigration, language policies, education, religion, labor and Latina women's issues.	
SOC 571. Advanced Race and Ethnic Relations	3 cr.
In-depth analysis of the dynamics of prejudice/discrimination and patterns of intergroup interaction in the U.S.	
SOC 572. Advanced Sociology of Medical Ethics	3 cr.
Major issues in the roles and relationships of health care providers and consumers, problems in communication, malpractice, patients' rights, and ethics. Taught with SOC 472 with additional work required at the graduate level.	
SOC 574. Sociology of Organizations	3 cr.
Sociological models of formal organizations relevant to business, education, government, healthcare, military, and religion. Focus on internal organizational structure and dynamics plus the reciprocal relationship between organizations and their operating environment.	
SOC 575. Graduate Social Stratification	3 cr.
Advanced examination of theories of stratification and current methods of stratification research. Focus on differences by ethnicity, race, class and gender.	
SOC 576. Seminar on Social Institutions in Appalachia	3 cr.
Survey of social issues of Appalachia including the emergence and perpetuation of stereotypical images, the impact of the coal industry on the social environment, and consideration of religious, political, and social policy.	
SOC 577. Advanced Sociology of Education	3 cr.
Socio-political and economic factors that shape the structure and operation of educational institutions in modern complex societies. Socio-historical development of the school as a microcosm of society, with examples from American and other school systems.	
SOC 578. Advanced Sociology of Development and the World System	3 cr.
Sociological approach to development and the global system. Theories of development, and underdevelopment; world poverty/inequality; Latin America; Africa and Asia in comparative perspectives; transnational borders/U.S.-Mexico border; current topics. Same as GOVT 577.	
SOC 579. Advanced Sociological Perspectives on the U.S.-Mexico Border	3 cr.
Theoretical perspectives and current research on U.S.-Mexico border region, including migration, identity, health, gender, and environment.	
SOC 580. Diversity in Alternative Families	3 cr.
Cross-cultural examination of diversity among and within families: analysis of family diversity includes consideration of the theoretical frameworks, ideological commitments, personal experiences, and methodological approaches to examine family life.	
SOC 581. Issues in Social Deviance	3 cr.
Selected forms of deviant behavior, social issues, and social problems.	
SOC 582. Individual and Society	3 cr.
Examines reciprocal relationship between individual and society. Topics include socialization, social influence and persuasion, group structure and performance, altruism, aggression, interpersonal attraction, group cohesion and conformity, and intergroup conflict.	
SOC 583. Symbolic Interaction	3 cr.
Examination of the interaction of self and the social order including society as process, the negotiation of social order, identity as a social product, role taking and the situated self, the social construction of reality with an emphasis on phenomenology and ethnomethodology.	
SOC 589. Advanced Issues in Globalization	3 cr.
Analysis of the globalization process. Covers theories of globalization; global economy; political globalization; global culture; transnational social movements; transnational migration and world labor market; global cities; local-global linkages. Same as GOVT 569.	
SOC 596. Internship	1-6 cr.
Supervised participation in appropriate occupational setting. May be repeated for a maximum of 12 credits. Taught with SOC 496 with additional work required at the graduate level.	
SOC 597. Problems in University Instruction	1-2 cr.
For description see G S 597 under Graduate School. Graded S/U.	
SOC 599. Master's Thesis	0-6 cr.
Thesis. Consent of instructor required. Restricted to SOC majors.	

SPANISH

Department website: <http://www.nmsu.edu/~langling/>
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B. Pollack, Graduate Director, Ph.D. (California, Santa Barbara); J. J. Barquet, Ph.D. (Tulane); J. M. García, Ph.D. (Kansas); Spencer R. Herrera, Ph.D. (New Mexico); J. Longwell, M.A. (New Mexico State); P. MacGregor-Mendoza, Ph.D. (Illinois-Champaign-Urbana); D. Villa, Ph.D. (New Mexico); M. Waltermire, Ph.D. (New Mexico)

DEGREE: Master of Arts
MAJOR: Spanish

MINOR: Spanish

The Department of Languages and Linguistics offers a Master of Arts in Spanish, which may be completed through our program on the main campus or completely online. Students are asked to specialize in either linguistics or literature. For admission, students must satisfy general requirements of the Graduate School. Students must also complete a secondary admission packet which is detailed on our departmental website.

The Degree Plan

The degree plan requires a minimum of 36 credits in Spanish, of which at least 30 must be earned at the 500 level, and the remainder above the 450 level. The courses should be concentrated in the student's chosen area of study (linguistics or literature) as each student will be tested on a reading list that corresponds to each area study. A thesis is optional. Students who authorized to complete a thesis may count a maximum of 6 credits of thesis work toward the degree. At the present time, the thesis option is not available for online students. There are no required core courses at this time and a student should work closely with his/her advisor and the Graduate Director to establish an appropriate individual degree plan.

All students in either the on-campus or online program may complete a minor at the master's level by taking 9 credits (3 courses) at the 500 level or above, in another area (department) of study, or within the department itself. For instance, a student studying linguistics may wish to obtain a minor in literature or a student studying literature may wish to obtain a minor in linguistics. In either case, the minor credits count as part of the 36 total credits required for the degree. In all cases, the student should work closely with the Graduate Director to ensure his/her particular plan of study is acceptable to the program.

Additional Language Requirement

For both the on-campus and online degrees, the department requires that students fulfill a second language requirement (in addition to English and Spanish) by following an approved course of study. Typically, this is completed by taking a four-semester course of study, but may vary according to the languages available. Students should consult the Graduate Director to establish a plan and discuss how this requirement will be met.

TOEFL Requirement

Students are required to demonstrate proficiency in English and meet all international admissions requirements prior to beginning their program of study. Please see the section of the Graduate Catalog on international admissions requirements.

Final Examinations

Students must successfully complete a final department examination (generally during the student's final semester of coursework) that is partially written and partially oral. Please consult the Graduate Director for specific information on dates and format for these exams.

Graduate Assistantships

For the on-campus program only, the department awards graduate assistantships to qualified students. For this financial assistance, the student works up to 20 hours a week in departmental programs, chiefly in the teaching of elementary and intermediate Spanish courses in either the Heritage Language sequence or Spanish as a second Language sequence. Students interested in being considered for an assistantship should clearly state this interest in their introduction letter during the application process. The department offers a limited number of assistantships, and students should remember that not everyone

that applies for this award receives one. Maintaining the award depends on the student's successful performance both academically and in the classes he/she teaches and is evaluated on a semester-by-semester basis. Students that receive an assistantship are required to take SPAN 594 (see course description) as part of their degree plan in order to help them prepare for teaching classes at NMSU.

SPANISH

- SPAN 450. Mexican Cultures** 3 cr.
Different aspects of Mexican Culture. Selected topic to be identified by subtitle in the Schedule of Classes. May be repeated for a total of 6 credits under a different subtitle. Prerequisite(s): SPAN 312 or SPAN 313.
- SPAN 451. Hispanic Cultures** 3 cr.
Issues in Hispanic cultures of the U.S., Spanish-America, and Spain. Also focuses on U.S.-Mexico border culture. Selected topics to be identified by subtitle in the Schedule of Classes. May be repeated for a total of 9 credits under a different subtitle. Prerequisite(s): SPAN 312 or SPAN 313.
- SPAN 453. Independent Studies in Hispanic Linguistics** 1-3 cr.
Individualized self-paced projects for advanced students. Prerequisites: consent of instructor. May be repeated for a maximum of 6 credits.
- SPAN 457. Strategies for Teaching Spanish for Native Speakers** 3 cr.
Strategies and techniques appropriate for teaching Spanish for Native Speakers. Emphasis on curriculum development and use of U.S. Hispanic literature in the classroom. Focus on processes of acquisition and evaluation of all four skills. Prerequisite: SPAN 314.
- SPAN 460. Spanish Language Acquisition** 3 cr.
Research and theories of acquisition of Spanish as a first or second language. Prerequisite: LING 200 or SPAN 340, or consent of instructor.
- SPAN 461. Introduction to Spanish Phonetics** 3 cr.
An introduction to Spanish phonetics including basic dialectal variation and comparison with English. Prerequisite: SPAN 340.
- SPAN 462. Spanish Phonology** 3 cr.
An in-depth examination of the sound system of Spanish including formal characterization, dialectal variation and laboratory data. Prerequisite: SPAN 461 or SPAN 492.
- SPAN 469. Gender and Sexuality in Hispanic Film** 3 cr.
The study of gender and sexual orientation issues in relation to identity as portrayed in Hispanic cinema. Crosslisted with: W S 469
- SPAN 470. Methods for Teaching Hispanic Children s and Adolescents Literature** 3 cr.
Current methods for teaching children s and adolescents literature for levels K-16. Researches appropriate literature for each level, and techniques and strategies to design teaching units and activities.
- SPAN 479. Spanish for Teachers Bilingual Certification** 3 cr.
Formal preparation for the New Mexico Bilingual Endorsement Exam. Systematic study of individual student development and measurement of Spanish skills. Focuses on development of the four skills and culture in Spanish. Prerequisites: SPAN 313 and SPAN 314, or consent of instructor.
- SPAN 490. Special Topics** 3 cr.
Selected topic to be identified by subtitle in the Schedule of Classes. May be repeated for a total of 9 credits under a different subtitle. Prerequisite(s): SPAN 312 or SPAN 313.
- SPAN 491. History of the Spanish Language** 3 cr.
The development of Spanish from its origins. Prerequisite: SPAN 314 or SPAN 340.
- SPAN 492. Structure of Spanish** 3 cr.
Topics in Spanish linguistics including phonology, morphology, syntax, and semantics. Prerequisite: SPAN 314 or SPAN 340.
- SPAN 493. Studies in U.S. and Borderland Spanish** 3 cr.
Linguistic issues of U.S. and borderland Spanish. Prerequisite: SPAN 340.
- SPAN 500. Methods of Research and Literary Criticism** 3 cr.
Advanced methods of research and literary criticism.
- SPAN 501. Graduate Elementary Spanish I** 4 cr.
Spanish for beginners at the Graduate level. Available via Study Abroad only. Credit can be applied only towards fulfilling second language requirement. Credit is not accepted towards any graduate level major or minor.
- SPAN 502. Graduate Elementary Spanish II** 4 cr.
Spanish for beginners at the Graduate level. Available via Study Abroad only. Credit can be applied only towards fulfilling second language requirement. Credit is not accepted towards any graduate level major or minor. Prerequisite: Language placement exam or C or better in SPAN 501, or consent of instructor.
- SPAN 503. Graduate Intermediate Spanish I** 3 cr.
Spanish for intermediate students at the Graduate level. Available via Study Abroad only. Credit can be applied only towards fulfilling second language requirement. Credit is not accepted towards any graduate level major or minor. Prerequisite: Language placement exam or C or better in SPAN 502, or consent of instructor.
- SPAN 504. Graduate Intermediate Spanish I** 3 cr.
Spanish for intermediate students at the Graduate level. Available via Study Abroad only. Credit can be applied only towards fulfilling second language requirement. Credit is not accepted towards any graduate level major or minor. Prerequisite: Language placement exam or C or better in SPAN 503, or consent of instructor.
- SPAN 507. Technology Enhanced Language Learning** 3 cr.
Strategies for enhancing language learning with emerging technologies. Course is taught in Spanish.
- SPAN 508. Teaching Literature with Technology** 3 cr.
Strategies and techniques for enhancing the teaching of all literature genres using emerging technologies. Course is taught in Spanish. Co/Prerequisite(s): SPAN 507, and/or consent of instructor.
- SPAN 509. Teaching Culture with Technology** 3 cr.
Strategies and techniques for enhancing the teaching of culture using emerging technologies. Course is taught in Spanish. Co/Prerequisite(s): SPAN 507, and/or consent of instructor.
- SPAN 510. Implementing the 5 C's Using Technology** 3 cr.
Strategies and techniques for bringing the national standards (the 5Cs: Communication, Cultures, Connections, Comparisons, Communities) into the classroom using emerging technologies. Course is taught in Spanish. Co/Prerequisite(s): SPAN 507, and/or consent of instructor.
- SPAN 512. Contemporary Spanish-American Poetry** 3 cr.
Readings and interpretation of Spanish-American poetry from the 20th century to the present.
- SPAN 521. Advanced Cuban Literature** 3 cr.
Advanced study of major works or specific topics or periods of Cuban Literature. Selected topics to be identified by subtitle in the Schedule of Classes. May be repeated for a total of 6 credits under a different subtitle.
- SPAN 528. Advanced Hispanic Literature of the U.S.** 3 cr.
Advanced study of major works by Cuban-American, Dominican-American, and U.S.-Puerto Rican authors.
- SPAN 538. Advanced Strategies for Development of Spanish Proficiency** 3 cr.
Methods for facilitating language acquisition and enrichment for both native and nonnative speakers of Spanish. Emphasis on materials development for both in- and out-of-class activities. Prerequisites: completion of SPAN 313 and SPAN 314.
- SPAN 540. Introduccion a la Linguistica** 3 cr.
Introduces students to the foundational topics of linguistic study with particular reference given to the Spanish language: properties of language and communication, morphology, syntax, phonetics, phonology, language variation and change. Prerequisite(s): Eligibility to take graduate level courses.
- SPAN 546. Advanced Poesia Modernista** 3 cr.
Advanced study of major poetry works by Latin American modernista authors.
- SPAN 547. Advanced Hispanic Film** 3 cr.
Advanced study of major films from Spain and Spanish-America.
- SPAN 548. Advanced U.S.-Hispanic Film** 3 cr.
Advanced study of major films about and/or by Hispanics of the U.S.
- SPAN 552. Advanced Literature of the Mexican Revolution** 3 cr.
Study of Mexican authors dealing with the Mexican Revolution.
- SPAN 555. Advanced Spanish-American Literature Through the 18th Century** 3 cr.
Advanced study of Spanish-American Literature through the 18th century.
- SPAN 556. Advanced 19-Century Spanish-American Literature** 3 cr.
Study of major works by Spanish-American authors of the 19th century.
- SPAN 558. Bilinguismo** 3 cr.
Examines the topics of bilingualism from a psycholinguistic perspective including the development of the bilingual brain, lexical acquisition, retrieval and storage, and experimental techniques in measuring language competence. Prerequisite(s): SPAN 540 or consent of instructor.
- SPAN 560. Advanced Spanish Language Acquisition** 3 cr.
Advanced research and theories of acquisition of Spanish as a first or second language. Prerequisite: SPAN 500 or consent of instructor.
- SPAN 561. Advanced Spanish Phonetics** 3 cr.
Advanced study of Spanish phonetics, including basic dialectal variation and comparisons with English.
- SPAN 562. Advanced Spanish Phonology** 3 cr.
An advanced formal examination of the sound system of Spanish including

formal characterizations, dialectal variation and laboratory data.		
SPAN 563. Advanced Study in Mexican Literature	3 cr.	
Mexican literature from the Pre-Columbian period to the present.		
SPAN 564. Advanced Caribbean Literature in Spanish	3 cr.	
Major works of Cuban, Dominican, and Puerto Rican literature.		
SPAN 566. Contemporary Spanish-American Novel	3 cr.	
The Spanish-American novel from the 20th century to the present.		
SPAN 567. Advanced Study in Chicano Literature	3 cr.	
Study of all genres of Chicano literature.		
SPAN 569. Advanced Study in Literatura de la Frontera	3 cr.	
Advanced study of all genres of literature of the U.S.-Mexico border.		
SPAN 570. Advanced Study in Technical Translation	3 cr.	
Translation of a variety of non-literary texts from English to Spanish and from Spanish to English. Course is taught in Spanish.		
SPAN 572. Advanced Study in Literary Translation	3 cr.	
Literary translation of texts by genre from Spanish to English and from English to Spanish.		
SPAN 573. Advanced Study in Creative Writing	3 cr.	
Advanced creative writing in Spanish.		
SPAN 580. Research Methodology in Spanish Linguistics	3 cr.	
Study and practical application of techniques in linguistic research.		
SPAN 581. Advanced Prosa Modernista	3 cr.	
Advanced study of major prose works by Latin American modernista authors.		
SPAN 583. Advanced Study in Spanish-American Women Writers	3 cr.	
All genres of Spanish-American literature written by women. Research paper required.		
SPAN 585. Language Assessment	3 cr.	
Introduces students to theoretical principles of and analytical techniques for language assessment. Students will learn to critically analyze existing language assessment measures and will develop, pilot test and analyze measures of their own. Prerequisite(s): SPAN 540 or SPAN 560 or SPAN 580 or consent of instructor.		
SPAN 586. Contemporary Spanish-American Essay	3 cr.	
Main currents in the Spanish-American thought from the 20th century to the present.		
SPAN 587. Contemporary Spanish-American Short Story	3 cr.	
The Spanish-American short story from the 20th century to the present.		
SPAN 588. Contemporary Spanish-American Drama	3 cr.	
The Spanish-American drama from the 20th century to the present.		
SPAN 589. Spanish Sociolinguistics	3 cr.	
Relationship between language and society in the Spanish-speaking world.		
SPAN 590. Advanced Special Topics	3 cr.	
Specific subject to be announced in the Schedule of Classes. May be repeated for a total of 9 credits under a different subtitle.		
SPAN 591. Advanced Study in History of the Spanish Language	3 cr.	
The development of Spanish from its origins.		
SPAN 592. Advanced Structure of Spanish	3 cr.	
Advanced study of Spanish linguistics topics such as phonology, morphology, syntax and semantics.		
SPAN 593. Advanced Studies in Southwest Spanish	3 cr.	
Includes historical background, bilingualism and bilingual education, language maintenance, language planning and Chicano sociolinguistics.		
SPAN 594. Theory and Methodology of Spanish Pedagogy	3 cr.	
Advanced studies in current theories and methodologies of Spanish language pedagogy. Taught as a practicum.		
SPAN 595. Advanced Topics in Applied Spanish Linguistics	3 cr.	
Selected topics to be identified by subtitle in the Schedule of Classes. May be repeated for a total of 9 credits under a different subtitle.		
SPAN 596. Advanced Gender and Sexuality in Hispanic Film	3 cr.	
Advanced study of gender and sexual orientation issues in relation to identity as portrayed in Hispanic cinema. Crosslisted with: W S 569		
SPAN 597. Spanish for Native Speakers: Advanced Teaching Strategies	3 cr.	
Advanced strategies and techniques appropriate for teaching Spanish for native speakers. Curriculum development and use of U.S. Hispanic literature in the classroom. Focus on processes of acquisition and evaluation of all four skills. Research project required. Prerequisite: graduate standing.		
SPAN 598. Independent Reading, Research, and/or Creative Writing	1-3 cr.	
Individual study of selected readings and problems; or individual research, either analytical or experimental; or creative writing. May be repeated for unlimited credits.		
SPAN 599. Master's Thesis	0-88 cr.	
Thesis.		

COLLEGE of BUSINESS

Dean • *Garrey Carruthers*

Associate Dean • *Kathleen Brook*

Associate Dean • *Kevin Boberg*

MBA Academic Advisor • *John Shonk*

ACCOUNTING

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E. A. Scribner, department head, Ph.D. (Oklahoma State)- C.P.A.- financial accounting and accounting systems; M. J. Billiot, D.B.A. (Mississippi State), C.P.A.-managerial and financial accounting; R. Calk, Ph.D. (Oklahoma State), C.P.A.-managerial accounting; K. McNelis, Ph.D.(Texas-Arlington), C.P.A.-managerial and financial accounting; K. Melendrez, Ph.D. (University of Arizona), financial accounting; S. K. Mills, Ph.D. (Texas Tech), C.P.A.-managerial accounting; C. Seipel, Ph.D. (Oklahoma State), C.P.A., C.F.E.-financial accounting and auditing; W. Smith, Ph.D. (New Mexico State), C.P.A. – financial accounting and taxation; P. L. Tunnell, Ph.D. (Oklahoma State)- C.P.A.- taxation.

DEGREE: Master of Accountancy

MINOR: Accounting MINOR: Information Systems

MASTER OF ACCOUNTANCY

The last decade has witnessed a tremendous expansion in the knowledge base required for accounting professionals. The business environment has become increasingly complex, as evidenced by the growth in the body of accounting and auditing standards, tax, SEC, and other regulatory requirements. The accountant must also be well versed in communications and analytical skills, computer-based information systems, professional ethics, and global issues.

Neither the traditional four-year accounting program nor the M.B.A. provide the educational breadth and depth necessary to fully prepare students for the demands now imposed by many accounting careers. The major objective of the Master of Accountancy program is to provide for these increased educational needs and to prepare students more adequately for careers as professional accountants in financial institutions, government, nonprofit organizations, and public practice. The program is designed to provide a technical and theoretical foundation in accountancy at the advanced level and yet allow the student to take courses to accommodate individual needs.

The Master of Accountancy (M.Acc.) program is recommended for those students wishing to fulfill the 150-hour education requirement which most states, including New Mexico, have legislated as a requirement for taking the Uniform CPA Examination.

Graduate assistantships are available for a limited number of qualified students. Interested persons are urged to apply well within the deadlines set by the Graduate School. Inquiries should be addressed to the Master of Accountancy Director.

Admission requirements of the Graduate School must be met before the applicant may be admitted to the Master of Accountancy program. Consideration for admissions to the Master of Accountancy program is dependent on an applicant's undergraduate record and score on the Graduate Management Admissions Test (GMAT). Specifically, an applicant's undergraduate GPA is multiplied by a factor of 200 and the result is added to his/her GMAT score. The required total is 1100. Applicants scoring between 1000 and 1100 will be admitted to the program only with committee approval. The minimum acceptable GMAT score is 400. An acceptable score on the GMAT must be submitted at least one

month prior to the student's first enrollment unless the student meets one of the GMAT waivers listed below.

In addition to the aforementioned entrance requirements, an applicant's GPA in 7 upper division accounting prerequisites must be at least 3.0. For those students not receiving their undergraduate accounting degree at NMSU, it is expected that substantially all of the accounting prerequisite classes be from an AACSB accredited business school or the application will need to be approved by the MAcc Admissions Committee. In this case the Admissions committee may require that some of these prerequisite courses be retaken at an AACSB institution such as NMSU.

All grades, including those from the first attempt at repeated classes, will be used to compute upper division accounting prerequisite grade point averages to determine admission to the graduate program. At the suggestion of any faculty member, the MAcc. Admissions Committee will review the application of a student whose potential might not be accurately reflected by this calculation.

GMAT waivers:

The GMAT requirement is waived for those who:

- Are graduates of NMSU's Accounting program with at least a 3.25 GPA overall and a 3.25 GPA in their eight upper division accounting courses; or
- Hold a recognized professional accounting credential (such as CPA, CMA, CIA, CFE); or
- Hold a post baccalaureate degree (such as MBA, MS, MA, JD) from an approved, AACSB accredited U.S. university with a minimum of 3.0 in graduate course work.

Candidates for the Master of Accountancy degree who have an undergraduate degree in accounting must successfully complete a minimum of 30 graduate credits. Qualifying NMSU undergraduate accounting students can apply to have two graduate courses count for their undergraduate program as well as their graduate program. Candidates with an undergraduate degree in a field other than accounting must complete additional prerequisite work dependent upon previous courses taken. In any case, all candidates must present or fulfill the following requirements:

Foundation Courses

These courses are required of every student unless they can be waived. As a general policy, the courses upon which waivers are claimed must have been taken within seven years of enrollment in the program with a grade of B or better. A final decision regarding a waiver is based on an evaluation of each student's total educational and professional background. The following is a list of these courses (for a description of these courses, see the New Mexico State University Undergraduate Catalog):

- ACCT 251, Management Accounting
- ACCT 252, Financial Accounting
- BCIS 338, Business Information Systems I
- BLAW 316, Legal Environment of Business
- ECON 251G, Principles of Macroeconomics
- ECON 252G, Principles of Microeconomics
- FIN 341, Financial Analysis and Markets
- MGT 309, Human Behavior in Organizations
- MKTG 303
- BCIS485

Accounting and Related Prerequisites (21 credits)

In addition to the foundation requirements, each student must present or complete the equivalent of an undergraduate major in accounting. This requires, at a minimum, 21 credits of accounting above the elementary level.

No coursework applied toward the M.Acc. degree, including the foundation requirements and the undergraduate accounting prerequisites, may be taken on an S/U basis.

Core and Elective Courses (30 Credits)

Core Courses: Each student must complete 18 credits in accounting courses numbered above 503. These courses must include a research class (either ACCT 555 or 564) and ethics (ACCT 559) unless a student has already taken an equivalent course. In addition, three of the credits may be in upper division undergraduate elective accounting courses numbered 450 or higher. Other specific courses to be completed by each candidate will be determined in the advisement process.

Elective Courses: All students must complete a total of 12 additional credits in elective courses. Electives will be determined individually for each student and will include no more than 3 credits in accounting. At least 3 of the elective credits must be in courses reserved exclusively for graduate students and numbered 510 or higher. Neither ACCT 503 nor any course fulfilling the foundation requirement may be included.

The Graduate School requires that students must maintain a grade-point average of at least 3.0 in all courses taken as a graduate student, as well as a 3.0 grade-point average in all graduate courses taken as a graduate student at NMSU. The Department of Accounting and Information Systems requires, in addition, that every candidate for the M.Acc. degree must maintain at least a 3.0 grade-point average in all accounting courses used to satisfy the core and elective course requirement.

Comprehensive Examination

Satisfactory performance on a comprehensive examination is required for the degree.

Thesis: No thesis is required; however, under special approval, a candidate may elect to write a thesis under ACCT 599. Up to 6 credits may be earned for the thesis.

Admission to Master of Accountancy

Class Registration in any Accounting 500 level course requires

1. prior full admission to the M.Acc. program, or
2. prior consent of head of the Department of Accounting and Information Systems.

ACCOUNTING

ACCT 451. Auditing Theory and Practices	3 cr.
Auditing standards, audit evidence, auditors' reports and opinions, and professional responsibilities. Prerequisite(s): ACCT 351 and C or better in ACCT 302.	
ACCT 455. Federal Taxation II	3 cr.
Federal income tax laws applicable to partnerships, corporations, fiduciaries, tax research, tax planning. Prerequisite(s): C or better in ACCT 403 or consent of instructor.	
ACCT 456. Accounting for Nonprofit Organizations	3 cr.
Control and reporting problems unique to governmental units and other nonprofit organizations. Fund accounting principles, procedures, and reports. Prerequisite(s): C or better in ACCT 302.	
ACCT 457. Mergers, Acquisitions, and Partnerships	3 cr.
Consolidated financial statements, accounting for partnership formation and liquidation. Prerequisite(s): C or better in ACCT 302.	
ACCT 458. Accounting for Decision Making and Control	3 cr.
Accounting concepts and quantitative methods for developing, analyzing, and interpreting information for management's use in decision making. Prerequisite(s): ACCT 353.	
ACCT 459. Ethics and Professionalism in Accounting	3 cr.
Introduction to ethical reasoning, integrity, objectivity, independence, and professional accounting issues. Students will apply the concepts and theories to accounting-specific cases. Prerequisite: grade of C or better in ACCT 451 or concurrent enrollment or consent of instructor. Same as ACCT 559.	
ACCT 460. Fraud Examination and Prevention	3 cr.
Covers business fraud as it is occurring in American society. Emphasis is on occupational fraud and financial statement fraud. Examines various types of fraud, its symptoms and effective investigation techniques. Effective fraud prevention measures are discussed throughout the course. Emphasizes case studies and the application of principles to actual fraud cases. Prerequisite(s): a C or better in ACCT 451 or concurrent enrollment.	
ACCT 490. Selected Topics	1-3 cr.
Current topics in accounting. Prerequisites vary according to the seminar	

offered. May be repeated for a maximum of 12 credits under different subtitles.

ACCT 498. Independent Study	1-3 cr.
Individual studies directed by consenting faculty with the prior approval of the department head. Prerequisites: junior or senior standing and consent of instructor. A maximum of 3 credits may be earned.	
ACCT 503. Accounting for Managers	3 cr.
Concepts and principles of financial and managerial accounting. Presents techniques used to measure business transactions, prepare financial statements, techniques for management decision-making, planning, and control. Not open to M.Acc students. Prerequisite(s): B or better in ACCT 251 and ACCT 252.	
ACCT 525. Advanced Cost-Managerial Accounting	3 cr.
Advanced cost-managerial concepts with a quantitative emphasis. Integrates cost-managerial concepts, quantitative tools, organization theory, behavioral concepts and computer methodology. Prerequisite: ACCT 353.	
ACCT 544. Financial Statement Analysis and Valuation	3 cr.
Valuation of firms using financial information, financial statement analysis, and the valuation of individual assets and liabilities. Prerequisite(s): ACCT 302; Graduate students only.	
ACCT 550. Special Topics	3 cr.
Seminars in current topics in various areas of accounting including financial, managerial, auditing, taxation, systems, and fund accounting. Prerequisites vary according to topic being offered.	
ACCT 551. Advanced Auditing Theory and Practice	3 cr.
Understanding and evaluating internal control in an EDP environment. Statistical sampling applications and current issues in auditing. Prerequisites: ACCT 451 and ACCT 452.	
ACCT 554. Advanced Accounting Theory	3 cr.
Contemporary theoretical basis of accounting. An in-depth study of generally accepted accounting principles and current issues in accounting. Prerequisite: ACCT 302 or consent of instructor.	
ACCT 555. Federal Tax Research	3 cr.
Tax research methodology including case materials, critical judicial decisions, journal articles, and research services. Emphasis on tax planning. Prerequisite: ACCT 403 or consent of instructor.	
ACCT 559. Ethics and Professionalism in Accounting	3 cr.
Introduction to ethical reasoning, integrity, objectivity, independence, and professional accounting issues. Students will apply the concepts and theories to accounting-specific cases. Prerequisites: C or better in ACCT 451 or concurrent enrollment. Same as ACCT 459.	
ACCT 560. Taxation of Corporations and Shareholders Advanced	3 cr.
Effects of taxation on the organization, operation, and reorganization of corporations and on their shareholders. Prerequisite(s): ACCT 455 or consent of instructor.	
ACCT 564. Financial Accounting Research	3 cr.
Interpretation and application of accounting principles to financial reporting issues of business and nonbusiness organizations. Consent of instructor required. Prerequisite(s): Undergraduate degree in accounting or equivalent. Restricted to Master of Accountancy majors.	
ACCT 565. Estate Planning and Taxation	3 cr.
Effects of income, gift, and estate taxation on accumulation and preservation of an estate. Prerequisite: ACCT 455 or consent of instructor.	
ACCT 570. Taxation of Partnerships	3 cr.
Taxation of partnership contributions and distributions, transfer of partnership interests, and allocations of partnership income. Also includes taxation of S corporations. Prerequisites: graduate students only; ACCT 403 or consent of instructor.	
ACCT 580. Professional Accountancy	3 cr.
Prepares students for the accounting profession and professional certification through study of a wide range of topics similar to those a student might encounter in their first year of employment. Counts for elective credit only. Prerequisite(s): Graduate students only.	
ACCT 598. Independent Study	1-3 cr.
Individual studies directed by consenting faculty with prior approval of the department head. A maximum of 3 credits may be earned. Prerequisite: consent of instructor.	
ACCT 599. Master's Thesis	0-88 cr.
Thesis.	

APPLIED STATISTICS

Department website: <http://business.nmsu.edu/graduate/statistics/index.html>
(575) 646-2936
rsteiner@nmsu.edu

R. Adkisson, department head, Ph.D. (Nebraska)- international economics, public finance, institutional economics; D. Clason, Ph.D. (Kansas State)-linear models, regression analysis; D. Daniel, Ph.D. (Southern Methodist)-nonparametrics, general consulting; W. Gould, Ph.D. (North Carolina State)-biological sampling, wildlife and fisheries estimation; D. J. Mundfrom, Ph.D. (Iowa State)- general methods, multivariate statistics and linear models; R. Steiner, Ph.D. (Oklahoma State)-likelihood methods, discrete distributions, simulation; D.M. VanLeeuwen, Ph.D. (Oregon State)-statistics

DEGREE: Master of Science
MAJOR: Applied Statistics

MINOR: Applied Statistics

Offered by the Department of Economics and International Business, the Master of Science (M.S.) degree in applied statistics is designed to produce graduates proficient in current practices in statistics and able to enter directly into positions in industry, government, or private business. A person completing this degree will have the requisite skills to help researchers outside of statistics execute data analyses, design experiments, and/or plan and analyze biological surveys or surveys obtained by mail, phone, or personal interview. In addition, a person completing this degree will be familiar with the major statistical packages for computers. Students in the program will receive instruction in both theory and application of statistics, oriented strongly towards linear models and sampling, as well as extensive training and experience in statistical consulting.

The M.S. degree serves two basic groups of students: (1) students with degrees in areas other than mathematics who wish to strengthen their quantitative skills and (2) students with a degree in mathematics or statistics or those with a strong minor in mathematics who wish to apply statistics in one or more subject matter areas.

ADMISSION AND COURSE REQUIREMENTS

Candidates for the M.S. in applied statistics are required to successfully complete a minimum of 36 semester credits.

Credit Requirements (minimum)

Core Courses (24 cr.)

Theory	14
Consulting	4
Methods	6
Research	4-6
Electives	8 or more

Requirements for regular admission to the MS in Applied Statistics include the following:

- A minimum 3.0 grade-point average overall or in the last two years of study. Complete graduate and undergraduate transcripts must be supplied.
- Three semesters of engineering calculus, equivalent to MATH 191G, MATH 192G, and MATH 291 at NMSU, completed with B or better grades.
- A one-semester course in introductory statistics. Students entering with only one undergraduate course in statistics will generally take A ST 505. NOTE: A ST 505 does not carry credit toward the M.S. in applied statistics.
- Three letters of reference from former professors or others able to evaluate the student's academic potential.
- A one- to two-page typewritten letter of application, discussing academic objectives, and professional plans, plus giving specific reasons for selecting statistics as a field for advanced studies.

In addition to the formal requirements above, some expertise in computer use or programming experience is strongly recommended.

Applicants whose native language is not English must take the Test of English as a Foreign Language (TOEFL). Fluency in written and spoken English is essential to successful completion of the program. Further information regarding the TOEFL can be obtained from Test of English as a Foreign Language, CN 6151, Princeton, NJ 08541-6151, USA.

MINOR REQUIREMENTS

Master's-level students wishing to minor in applied statistics at the master's level must have at least 10 credits of 500-level applied statistics courses. The recommended courses for a general master's-level minor are A ST 503, A ST 504, A ST 505 and A ST 506. Depending on a particular student's background, it may be desirable to substitute other A ST courses for the minor. In accordance with Graduate School requirements, doctoral students must have at least 12 credits of 500-level applied statistics courses for a minor at the doctoral level.

Students wishing to obtain the minor in applied statistics should contact an applied statistics faculty member to recommend appropriate applied statistics course work to be included in the plan of study and to serve as the graduate committee representative from the minor area.

APPLIED STATISTICS

- A ST 450. Special Topics 1-4 cr.
 Specific subjects and credits announced in the Schedule of Classes. Maximum of 4 credits per semester and a grand total of 9 credits.
- A ST 456. Statistical Methods and Data Analysis 3 cr. (2+2P)
 Methods for sampling and estimation; analysis of variance and elementary experimental designs; linear regression and correlation; multiple regression, variable selection methods and residual analysis; introduction to statistical packages. Prerequisite: A ST 251G, A ST 311, or equivalent.
- A ST 498. Independent Study 1-3 cr.
 Individual studies directed by consenting faculty with prior approval of the department head. Maximum of 3 credits per semester and a grand total of 3 credits.
- A ST 503. SAS Basics 2 cr. (1+2P)
 A brief introduction to the statistical software package, SAS, and its utilization in an interactive computing environment, primarily CMS/ SAS. Provides a fundamental understanding of the structure of SAS, its data management capabilities, and how to invoke a variety of descriptive and simple statistical SAS procedures. Statistical concepts will not be a primary focus. Corequisite: A ST 456, A ST 501, or A ST 505, or consent of instructor.
- A ST 504. Statistical Software Applications 1 cr.
 Optional computing course to accompany A ST 506. Computer analysis of topics covered in A ST 505 and A ST 506. Prerequisite: A ST 503 or consent of instructor. Corequisite: A ST 506 or A ST 502 or consent of instructor.
- A ST 505. Statistical Inference I 4 cr. (3+2P)
 A qualitative introduction to the concepts and methods of statistical inference. Sampling, frequency distributions (z , t , x^2 , F), estimation, and testing. One-way analysis of variance. Simple linear regression. Prerequisite: consent of the instructor.
- A ST 506. Statistical Inference II 3 cr. (2+2P)
 Introduction to multiple regression; the analysis of variance for balanced studies; multiple comparisons, contrasts, factorials, experimental designs through split plots. Prerequisite: A ST 505 and the ability to use a standard computer package such as SAS (may be satisfied by A ST 503) or consent of instructor.
- A ST 507. Advanced Regression 3 cr.
 Examination of multiple regression; residual analysis, collinearity, variable selection, weighted least squares, polynomial models, and nonlinear regression: linearizable and intrinsically nonlinear models. Prerequisites: A ST 503 and A ST 505 or consent of instructor.
- A ST 508. Analysis of Advanced Designs and Related Topics 3 cr.
 Complete and incomplete block designs; fixed, mixed, and random models; unbalanced data; analysis of covariance; nested experiments; fractional factorials. Prerequisites: A ST 504, and one of A ST 502 or A ST 506; or consent of instructor.
- A ST 521. Sampling Methodology 3 cr. (3+2P)
 Methodology of sampling finite populations using design-based (simple random, stratified, systematic, cluster, and multistage), model-based (regression and ratio estimators), and adaptive sampling. Properties of estimators under all designs are discussed. Prerequisite: either A ST 456, A ST 501, A ST 505, A ST 565, or consent of instructor.
- A ST 522. Survey Sampling 2 cr. (3+2P)
 Techniques of survey sampling (mail questionnaire and telephone surveys) applicable to social sciences. Techniques of questionnaire preparation and methods of evaluating results are presented. Prerequisite: A ST 521, or consent of instructor.
- A ST 523. Biological Sampling (s) 3 cr.
 Methods of sampling biological populations: area frame, quadrant, line intercept, line transect, and mark-recapture. Prerequisite: A ST 501 or A ST 505 or consent of instructor.

- A ST 524. Selected Topics in Sampling 2 cr.
Treatment of nonresponse in sample surveys; response error modeling and estimation. Other topics to be selected from among the following: approximate methods for variance estimation, panel rotation sampling, longitudinal survey design and estimation, telephone random-digit-dialing, model based estimation, and multiplicity sampling. Prerequisite: A ST 521 or consent of instructor.
- A ST 545. Time Series Analysis and Applications 3 cr.
A systematic exposition of the methods for analyzing, modeling, and forecasting time series. Emphasizes underlying ideas and methods rather than detailed mathematical derivations, using SAS, BMDP, IMSL, and Fortran. Prerequisites: A ST 503 and A ST 501 or A ST 505, or consent of instructor.
- A ST 550. Special Topics 1-4 cr.
Specific subjects to be announced in the Schedule of Classes. Maximum of 4 credits per semester. No more than 9 credits toward a degree.
- A ST 551. Introduction to Statistical Consulting 1 cr.
Consideration of published material in the consulting process. Prerequisite: consent of instructor. Restricted to majors. Graded S/U.
- A ST 552. Advanced Statistical Consulting 1 cr.
Continuation of A ST 551 with emphasis on dealing with clients in order to identify statistically relevant features of a research study. Prerequisite: A ST 551. Restricted to majors. Graded S/U.
- A ST 553. Practicum in Statistical Consulting 1 cr.
Supervised experience under the guidance of senior faculty. Prerequisite: A ST 552. May be repeated for a maximum of 2 credits. Restricted to majors. Graded S/U.
- A ST 555. Applied Multivariate Analysis 3 cr.
Multivariate analysis of linear statistical models, including MANOVA and repeated measures. Analysis of correlation and covariance structures, including principal components, factor analysis, and canonical correlation. Classification and discrimination techniques. Prerequisites: A ST 506 and A ST 504 or consent of instructor.
- A ST 565. Statistical Analysis I 4 cr. (3+2P)
An analytic introduction to the theory and methods of statistical inference. Sampling, frequency distributions (z, t, x², F), estimation, testing, and simulation. Prerequisite: MATH 291G or consent of instructor.
- A ST 566. Statistical Analysis II 4 cr. (3+2P)
Continuation of A ST 565. Prerequisite: A ST 565 or consent of instructor.
- A ST 567. Applied Linear Models I 3 cr.
The mean model, including constraints, approach to linear models; non-identity variance-covariance matrices. Some emphasis on computational aspects and relation to statistical packages. Prerequisite: A ST 566 or consent of instructor.
- A ST 568. Applied Linear Models II 3 cr.
The relation of full to less-than-full rank linear models; complex data structures, including messy data, empty cells, and components of variance: extensions to categorical data analysis and nonparametric methods. Continues some emphasis on computational aspects. Prerequisite: A ST 567.
- A ST 596. Independent Study 1-3 cr.
Individual studies directed by consenting faculty with prior approval by department head. Prerequisite: consent of instructor. May be repeated for a maximum of 3 credits.
- A ST 598. Special Research Problems 1-6 cr.
Individual analytical or experimental projects. Restricted to majors. Graded S/U.
- A ST 599. Master's Thesis 1-6 cr.
Thesis.

BUSINESS ADMINISTRATION

MBA Program website: <http://business.nmsu.edu/mba>
Ph.D. Program in Management website: <http://managementphd.nmsu.edu/>
Ph.D. Program in Marketing website: <http://marketingphd.nmsu.edu/>
Department Website: <http://business.nmsu.edu/>
(575) 646-2821

R. Adkisson, Ph.D. (Nebraska)-international economics, public finance, institutional economics; T. R. Adler, Ph.D. (Cincinnati)-policy and strategy, collaborative networks, information systems; K. J. Alt, Ph.D. (New Mexico State); A. Azadegan, Ph.D. (Arizona State)-supply chain management, innovation, organizational creativity, buyer-supplier relationships, outsourcing strategy; P. G. Benson, Ph.D. (Colorado State)-international human resource management, wage and salary administration; M. J. Billiot, D.B.A. (Mississippi State, C.P.A.)-managerial

accounting; J. W. Bishop, Ph.D. (Virginia Tech)-human resource management and organizational behavior; L. Blank, Ph.D. (Tennessee)-microeconomics, economics of regulated utilities; K. B. Boberg, Ph.D. (Penn State)-transportation, marketing; D. M. Boje, Ph.D. (Illinois)-organizational behavior, story telling, organizational change; K. Brook, Ph.D. (Texas)-money and banking, macroeconomic theory; R. Calk, Ph.D. (Oklahoma State, C.P.A.)-managerial accounting; C. I. Chavez, Ph.D. (SUNY-Albany)-organizational behavior, leadership, power/influence; D. L. Clason, Ph.D. (Kansas State)-linear models, government statistics; N. H. Compton, J.D. (Emeritus); B.F. Daily, Ph.D. (Missouri-Rolla)-operations management; D. L. Daniel, Ph.D. (Southern Methodist)-nonparametrics; M.E. de Boyrie, Ph.D. (Florida International)- international finance and trade issues; P. W. Dorfman, Ph.D. (Maryland)-human resource management, organizational behavior; S. Elias, Ph.D. (Colorado State)-influence in the workplace, occupational self-efficacy, organizational commitment and social power; L.G. Ellis, J.D. (Arizona State)-business law and contemporary legal issues; M. G. Ellis, Ph.D. (Emeritus); C. E. Enomoto, Ph.D. (Texas A&M)-microeconomic theory; C. A. Erickson, Ph.D. (Arizona State)-monetary theory, macroeconomics; R. D. Fortin, Ph.D. (Kansas)-corporate finance and investments; D.W. Garland, LL.M. (Southern Methodist)-commercial law, legal environment; D. A. Gegax, Ph.D. (Wyoming)-managerial economics, microeconomic theory; G. M. Goldberg, Ph.D. (Connecticut) – banking, financial institutions; W. R. Gould, Ph.D. (North Carolina State)-biological sampling, wildlife and fisheries estimation; S. R. Gray, Ph.D. (Texas A&M)-entrepreneurship, small business management; G.M. Hampton, Ph.D. (Washington)-global marketing; B. Huhmann, Ph.D. (Alabama)-advertising, consumer behavior; M. Hyman, Ph.D. (Purdue)-marketing theory and research; I.M. Jasso, Ph.D. (Houston)-advertising, strategy; R.J. Johns, LL.M. (Boston University)-employment law, international transactions; M. Jun, Ph.D. (Georgia State)-production and operations management; Y.J. Kreie, Ph.D. (Arkansas)-information systems; .L. Lee, Ph.D. (Southern Illinois-Carbondale)-international finance, international trade, international monetary system, economic development; J. Loveland, Ph.D. (Arizona State)- leadership, quality teams (Emeritus); M. R. Manning, Ph.D. (Purdue)-management, organizational development; K. J. Martin, Ph.D. (Purdue)-financial management, corporate control; B. N. Matta, Ph.D. (Emeritus); R. McFerrin, Ph.D. (Texas A&M)-microeconomics, macroeconomics, economic history; J. T. McGuckin, Ph.D. (Wisconsin)- production, resource economics and policy; K. McNelis, Ph.D. (Texas-Arlington) managerial and financial accounting; K. D. Melendrez, Ph.D. (Arizona)- financial accounting; S. K. Mills, Ph.D. (Texas Tech), C.P.A.-managerial accounting; C. Mora-Monge, Ph.D. (Toledo)-supply chain management, information systems; A. D. J. Mundfrom, Ph.D. (Iowa State)- general methods, multivariate statistics and linear models, J. J. A. Nelson, Ph.D. (Missouri)-information systems; M. Niculescu, Ph.D. (University of Cincinnati)- modeling consumer behavior; R. Oliver, Ph.D. (New Mexico State)-information systems; N. A. Oretskin, J.D. (Case Western School of Law)-contract law/negotiation; Collin R. Payne, Ph.D. (Brigham Young) - marketing and consumer behavior; J. T. Peach, Ph.D. (Texas)-quantitative economics, economic development; R. T. Peterson, Ph.D. (Washington)-marketing management; A. V. Popp, Ph.D. (Emeritus); J. Tim Query, Ph.D. (Georgia)-insurance, finance, risk management; G. A. Rosile, Ph.D. (Pittsburgh)-narrative research, organizational studies; G. P. Roth, Ph.D. (South Carolina)-corporate finance and investments; H. Sankaran, Ph.D. (Houston)-corporate finance, investments; E. T. Sautter, Ph.D. (Florida State)-consumer behavior and marketing methodology; E. A. Scribner, Ph.D. (Oklahoma State), C.P.A.-financial accounting, accounting systems; C. Seipel, Ph.D. (Oklahoma State), C.P.A.-financial accounting, auditing; D.B. Smith, Ph.D. (Emeritus); W.L. Smith, Ph.D. (New Mexico State), C.P.A.- taxation; C. Meghan Starbuck, Ph.D. (New Mexico)-environmental/resource economics, development, international business; R. L. Steiner, Ph.D. (Oklahoma State)-likelihood methods, discrete distributions; J. E. Teich, Ph.D. (SUNY-Buffalo)-quantitative management; K. Tian, Ph.D. (Georgia State)-consumer behavior; P. L. Tunnell, Ph.D. (Oklahoma State), C.P.A.-taxation; D.M. VanLeeuwen, Ph.D. (Oregon State)-statistics; J.Y. Weisinger, Ph.D. (Case Western Reserve)-cross-cultural management, diversity, culture, information technology; B. Widner, Ph.D. (Colorado State)-urban/regional, public finance, development; E. S. Willman, Ph.D. (Emeritus)

DEGREE: Master of Business Administration

SPECIALIZATION: Agribusiness

SPECIALIZATION: Finance

SPECIALIZATION: Information Systems

DEGREE: Doctor of Philosophy

MAJOR: Business Administration

SPECIALIZATION: Management
SPECIALIZATION: Marketing

MINOR: Management

MASTER OF BUSINESS ADMINISTRATION DEGREE

(505) 646-8003
 mba@nmsu.edu

The Master of Business Administration (M.B.A.) program is a professional program designed to provide students with a solid background in business practices and the problem-solving and people skills needed to become successful leaders in the global business environment. Program graduates are prepared for administrative or managerial positions in a wide variety of organizations, both private and governmental. The M.B.A. program is accredited by AACSB International-The Association to Advance Collegiate Schools of Business. Applicants must meet the basic admission requirements of the Graduate School before they are considered for admission to the M.B.A. program. To be considered for admission to the M.B.A. program, applicants must have:

1. completed an undergraduate degree with a GPA of at least 3.5 from an institution with business accreditation by AACSB International or ACBSP, or
2. completed the Graduate Management Admission Test (GMAT) with a minimum score of 400 and a combined GMAT score and undergraduate GPA such that $(\text{GPA} \times 200) + \text{GMAT}$ greater than or equal to 1050, or
3. received a graduate degree from a regionally accredited college of university, or
4. completed at least four years of relevant, full-time, post-degree, professional work experience with an undergraduate GPA of at least 3.25 from an institution with business accreditation by AACBS or ACBSP.

Official GMAT scores must be submitted to the M.B.A. Program Office at least one month prior to initial enrollment in the program. Although the program is designed to encourage participation by students with a variety of educational backgrounds, the curriculum is fast paced. As a consequence, a minimum level of background knowledge is expected of all entering students, and those who are lacking the necessary background in any of the knowledge areas indicated below will be required to make up their deficiencies early in the program.

Master of Business Administration Degree Requirements

Candidates for the Master of Business Administration degree must fulfill the requirements below.

Background Knowledge

Background knowledge may be demonstrated by successful completion (with a grade of A or B) of undergraduate courses in managerial accounting, financial accounting, macroeconomics, finance, human behavior in organizations, marketing, statistics, and calculus. At NMSU, the relevant courses are ACCT 251G and 252G, ECON 251, FIN 341, MGT 309, MKTG 303, A ST or STAT 251, and MATH 142G. Knowledge of each of these subjects may also be demonstrated by completing an examination as designed by the College of Business. For more information on examinations, contact the MBA Office.

Required Course Work (36 credits)

The MBA program consists of twelve courses beyond the background knowledge requirements. Eleven are required courses: ACCT 503, BCIS 502, BLAW 502, ECON 503, FIN 503, MGT 502, MGT 503, MGT 512, MGT 509, MKTG 303, and B A 590. Students requesting transfer credit for any courses must submit appropriate, written justification, including course descriptions, syllabi, etc. The following course sequencing requirements must be satisfied:

1. B A 590 must be completed during the final term of the student's program and is only open to students who have been accepted into the M.B.A. degree program. Effective with students entering in summer 2011, ACCT 503, BLAW 502, FIN 503, and MKTG 503 must be completed prior to enrollment in B A 590.
2. MGT 590 must be completed at the end of the student's program of study and is only open to students who have been accepted into the M.B.A. degree program. All MBA coursework other than B A 590 must be completed prior to or during the same terms as MGT 590.
3. A maximum of 9 credit hours of these courses may be completed prior to the student's acceptance into the M.B.A. degree program.

Elective Course Work

One elective is required in addition to the core MBA courses. This elective must be selected from the approved course list on the MBA web page.

Specialization in Agribusiness

Students who want to specialize in Agribusiness must take the following set of five AEEC courses in substitution of five courses included in the above "Required Course Work" list. The five AEEC courses included in the specialization in Agribusiness are:

- AEEC 511, Advanced Futures and Options Markets,
- AEEC 520, International Agricultural Trade Theory and Policy,
- AEEC 551, Advanced Agribusiness Marketing,
- AEEC 556, Advanced Agribusiness Management, and
- AEEC 585, Production Economics.

The five "Required Course Work" courses for which the above courses are substituted are:

- ECON 503, Managerial Economics,
- MGT 502, Operations Management,
- MGT 512, Quantitative Analysis for Business Decisions
- MKTG 503, Marketing Management
- Elective course (from the approved list).

Students who undertake the specialization in Agribusiness without having previously taken a course in Agricultural Policy will be required to take AEEC 545 prior to taking the five specialization courses.

Specialization in Information Systems

Students who want to specialize in Information Systems must take additional coursework beyond that required to complete the M.B.A. degree program. Four courses constitute the specialization in Information Systems. Choose four from this list:

- BCIS 540 – Information Systems Analysis and Design
- BCIS 560 – Enterprise Resource Planning & Business Processes
- BCIS 565- Enterprise Systems Development
- BCIS 575 – Management of Information Security
- BCIS 580 – Systems Design, Development, and Implementation
- BCIS 584 – Object-Oriented Systems Development Techniques
- BCIS 585 – Design of On-line Business Systems
- BCIS 590 – E-Commerce Security
- BCIS 595 – Database Management Systems

Students may choose certain combinations of the above BCIS courses to form recommended tracks and are encouraged to seek advising from the MBA Office or the Information Systems faculty in making course selections.

Specialization in Finance

MBA students who want to specialize in Finance must complete the following courses. (Finance 503 is a prerequisite for each of these courses).

- FIN 535 – Investment Concepts (students who took FIN 435 as undergraduates must substitute another 500 level finance course for FIN 535)
- FIN 545 – Money and Capital Markets
- FIN 555 – Derivative Markets and Securities
- FIN 566 - Advanced Financial Management

Final Examination

Oral defense of the paper written in fulfillment of the requirements of B A 590 will constitute the final examination as required by the Graduate School and will be scheduled and completed in accordance with timetables prescribed by, and other requirements of, the Graduate School.

Thesis

A thesis is not required. With special approval, however, a degree candidate may elect to write a thesis with at least 6 credit hours earned under B A 599 in lieu of B A 590.

Registration in Master of Business Administration Classes

Registration in any of the courses identified under "Required Course Work" above requires:

1. admission to the Graduate School,
2. acceptance into the "Senior Petitioner" program, or
3. consent of the Director of the M.B.A. program.

JOINT DEGREE—ENGINEERING/MBA PROGRAM

Academically outstanding, highly motivated undergraduate engineering students who would like to apply their quantitative skills and technical expertise to the business environment should inquire about the joint degree program through the College of Engineering or the M.B.A. Program Office. Students who are accepted into this program can, with full time enrollment and careful scheduling of their coursework, complete the M.B.A. degree requirements in as little as two semesters beyond completion of the B.S. degree. Information regarding the joint degree program may be obtained from the College of Engineering or the M.B.A. Program Office.

DOCTOR OF PHILOSOPHY IN BUSINESS ADMINISTRATION

The College offers a program leading to a Ph.D. degree. Currently concentrations are offered in management and marketing. Each candidate must:

- satisfy the common body of knowledge requirements in business;
 - demonstrate competency in statistics and research methods;
 - complete studies in a major field of concentration chosen from the departments of management or marketing in the College of Business;
 - complete studies in a minor field of concentration or interest area that supports the student's research, teaching, and/or career goals; and
 - Pass qualifying and comprehensive exams.
- complete and successfully defend a doctoral dissertation.

M.B.A. AND PH.D. COURSES

ACCOUNTING

Descriptions for the following courses may be found under the section "Accounting" at the beginning of this chapter.

ACCT 451. Auditing Theory and Practices	3 cr.
ACCT 455. Federal Taxation II	3 cr.
ACCT 456. Accounting for Nonprofit Organizations	3 cr.
ACCT 457. Mergers, Acquisitions, and Partnerships	3 cr.
ACCT 458. Accounting for Decision Making and Control	3 cr.
ACCT 459. Ethics and Professionalism in Accounting	3 cr.
ACCT 460. Fraud Examination and Prevention	3 cr.
ACCT 490. Selected Topics	1-3 cr.
ACCT 498. Independent Study	1-3 cr.
ACCT 503. Accounting for Managers	3 cr.
ACCT 525. Advanced Cost-Managerial Accounting	3 cr.
ACCT 544. Financial Statement Analysis and Valuation	3 cr.
ACCT 550. Special Topics	3 cr.
ACCT 551. Advanced Auditing Theory and Practice	3 cr.
ACCT 554. Advanced Accounting Theory	3 cr.
ACCT 555. Federal Tax Research	3 cr.
ACCT 559. Ethics and Professionalism in Accounting	3 cr.
ACCT 560. Taxation of Corporations and Shareholders Advanced	3 cr.
ACCT 564. Applied Accounting Concepts	3 cr.
ACCT 565. Estate Planning and Taxation	3 cr.
ACCT 570. Taxation of Partnerships	3 cr.
ACCT 580. Professional Accountancy	3 cr.
ACCT 598. Independent Study	1-3 cr.
ACCT 599. Master's Thesis	0-88 cr.

AGRICULTURAL ECONOMICS AND ECONOMICS

Descriptions for the following courses may be found under the section "Agricultural Economics And Economics" in the College of Agricultural, Consumer and Environmental Sciences.

AEEC 501. Microeconomic Theory	3 cr.
AEEC 502. Macroeconomic Theory	3 cr.
AEEC 511. Advanced Futures and Options Markets	3 cr.
AEEC 520. International Agricultural Trade Theory and Policy	3 cr.
AEEC 522. Public Sector Economics I	3 cr.
AEEC 523. Public Sector Economics II	3 cr.
AEEC 528. Economic Development	3 cr.
AEEC 540. Econometrics I	3 cr.

AEEC 545. Advanced Agricultural Policy	3 cr.
AEEC 550. Advanced Microcomputer Applications in Agriculture	3 cr. (2+2P)
AEEC 551. Advanced Agribusiness Marketing	3 cr.
AEEC 556. Advanced Agribusiness Management	3 cr.
AEEC 575. Advanced Water Resource Management and Policy	3 cr.
AEEC 580. Natural Resources and Environmental Policy	3 cr.
AEEC 585. Production Economics	3 cr.
AEEC 589. Global Agribusiness Environment	3 cr.
AEEC 590. Special Topics	3 cr.
AEEC 591. Agribusiness Management Seminar	1 cr.
AEEC 593. Internship	1-6 cr.
AEEC 594. Internship	1-6 cr.
AEEC 595. Internship (f,s,su)	1-6 cr.
AEEC 596. Individual Study	1-3 cr.
AEEC 597. Non-Thesis Research Project	1-3 cr.
AEEC 598. Creative Component Project	1-3 cr.
AEEC 599. Master's Thesis	0-88 cr.

BUSINESS ADMINISTRATION

B A 485. The Business of Science and Technology	3 cr.
This course examines business practices for science and technology organizations. The main focus of this course is to show the commercialization process, using business processes to transform an invention into a marketable product. For example, biomedical science discoveries reach patients through collaborative interactions among universities, private industry, and the government over a period of time. Strategic planning, marketing, finance accounting and management practices facilitate the transformation process. Topics include patents, funding, business plan preparation, risk management, and ethical conduct. This course will also address historical, current and global perspectives of science-driven and technology-driven businesses. Not open to MBA students.	
B A 490. Selected Topics	3 cr.
Prerequisites vary according to the seminar being offered.	
B A 491. Business Administration and Economics Internship and Cooperative Education III	1-3 cr.
Applications of the principles of business administration and economics. Registration in one course allowed per co-op work phase; a minimum of 12 work weeks is required. Open only to students in the College of Business. Option of S/U or a grade. The amount of academic credit (1-3 cr.) will be determined by the academic experience and not by the work experience.	
B A 498. Independent Study	1-3 cr.
Individual studies directed by consenting faculty with the prior approval of the department head. Prerequisite: junior or above standing and consent of instructor. A maximum of 3 credits may be earned.	
B A 500. Finance and Macroeconomics	3 cr.
Application and integration of financial theory, concepts and practice. Macroeconomic theory and public policy, national income concepts, unemployment, inflation, economic growth and international payment problems.	
B A 550. Special Topics	3 cr.
Interdisciplinary seminar in selected current business topics. Prerequisite(s): Prerequisites vary according to the seminar being offered.	
B A 585. The Business of Science and Technology	3 cr.
This course examines business practices for science and technology organizations. The main focus of this course is to show the commercialization process, using business processes to transform an invention into a marketable product. For example, biomedical science discoveries reach patients through collaborative interactions among universities, private industry, and the government over a period of time. Strategic planning, marketing, finance accounting and management practices facilitate the transformation process. Topics include patents, funding, business plan preparation, risk management, and ethical conduct. This course will also address historical, current and global perspectives of science-driven and technology-driven businesses. Not open to MBA students.	
B A 590. Professional Paper/Presentation	3 cr.
Paper written in close coordination with sponsoring professor and presented near the end of the student's final semester in the M.B.A. program. The paper will consist of a professional business report, a case study of a business or organization or a research report. Prerequisite(s): Minimum of B average (with no grade less than a C) in: ACCT 503, BLAW 502, FIN 503, and MKTG 503. Restricted to Master of Business Administration in their final semester majors.	

B A 598. Special Research Programs 1-3 cr.
Individual investigations either analytical or experimental. A maximum of 3 credits may be earned. Prerequisite: consent of instructor.

B A 599. Master's Thesis 0-88 cr.
Thesis.

BUSINESS COMPUTER INFORMATION SYSTEMS

BCIS 450. Systems Design, Development and Implementation 3 cr.
Design, development and implementation of business information processing systems. Includes maintenance, evaluation and system management considerations. Prerequisite: C or better in BCIS 350.

BCIS 455. Design of On-Line Business Systems 3 cr.
Covers analysis, design, and development of on-line, real-time computerized business-information systems. Prerequisite: C or better in BCIS 350; and BCIS 322 or concurrent enrollment or consent of instructor.

BCIS 458. Knowledge Management and Decision Support 3 cr.
Design, evaluation and implementation of computerized decision systems. Prerequisite: C or better in BCIS 338 or consent of instructor. Majors may not use this course to satisfy the requirements.

BCIS 460. Data Communications and Networks 3 cr.
Data communications for business computer systems. Local and wide area networks, data communications protocols and media, client-server and distributed processing systems. Prerequisite: C or better in BCIS 350 or consent of instructor.

BCIS 465. Business Systems Simulation 3 cr.
Simulation of business systems. Model design, implementation, testing and analysis. Prerequisites: C or better in BCIS 322 and STAT 251G.

BCIS 470. Object-Oriented Systems Development Techniques 3 cr.
Design and implementation of n-tier information systems in the object-oriented environment, including web-based interfaces, business logic, and database communication. Prerequisite: C or better in BCIS 350; and BCIS 322 or concurrent enrollment or consent of instructor.

BCIS 475. Database Management Systems 3 cr.
Design, development, and use of database management systems in the business environment. Prerequisite: C or better in BCIS 350 or consent of instructor.

BCIS 480. E-Commerce Security 3 cr.
Introduction to securing network-based applications from internal and external threats. Fundamentals of network security, including TCP/IP, firewalls, intrusion detection, and vulnerability. Prerequisite(s): C or better in BCIS 460 or ET 377 or consent of instructor.

BCIS 482. Management of Information Security 3 cr.
Provides management overview of information security and thorough examination of administration of information security. Surveys field of information security including planning, policy and programs, protection and people relative to information security. Prerequisite: BCIS 110 or equivalent. Taught with BCIS 575.

BCIS 485. Enterprise Resource Planning 3 cr.
This course covers concepts in enterprise resource planning (ERP). Topics include how ERP integrates business processes across functional areas--such as the procurement process and the sales order process--and how businesses use ERP information systems in day-to-day operations as well as for performance monitoring. SAP R/3 software will be used in several hands-on examples of ERP software as a real-world example of an ERP system. Prerequisite(s): C or better in BCIS 338 or BCIS 350 or ACCT 452.

BCIS 490. Selected Topics 1-3 cr.
Current topics in business systems analysis. Prerequisites vary according to topics being covered. May be repeated for a maximum of 12 credits under different subtitles.

BCIS 495. Enterprise Information Portals 3 cr.
Enterprise information portal (EIP) is a framework for integrating information, people and processes across organizational boundaries using web-based technologies. In this class, you will explore the wide range of options (EIP's) (e.g. SAP Netweaver Portal) provided to integrate ERP solutions, third-party applications, legacy systems, databases, unstructured documents, internal and external Web content, and collaboration tools. Taught with BCIS 565. Prerequisite(s): BCIS 485.

BCIS 498. Independent Study 1-3 cr.
Individual studies directed by consenting faculty with prior approval of the department head. Prerequisites: junior or above standing and consent of instructor. May be repeated for a maximum of 3 credits.

BCIS 502. Business Information Systems 3 cr.
Analysis of information systems as integral parts of business organizations, including the responsibility of management to understand their capabilities and uses in handling the organization's information flow and providing appropriate information for decision making. Prerequisite: graduate stu-

dents only.

BCIS 540. Information Systems Analysis and Design 3 cr.
Information systems development methodologies and the system life cycle. Justifying and managing systems development projects. Prerequisite: graduate students only.

BCIS 550. Special Topics 1-3 cr.
Seminars in selected current topics in business computer systems. Prerequisites vary according to topic being offered. May be repeated for a maximum of 3 credits.

BCIS 558. Knowledge Management and Decision Support 3 cr.
Design, evaluation and implementation of computerized decision systems. Same as BCIS 458 with differential assignments for graduate students.

BCIS 560. Enterprise Resource Planning & Business Processes 3 cr.
This course is an introduction to enterprise-wide information systems and their use in enterprise resource planning (ERP). This course will examine the many business processes and how they span functional areas such as marketing, production, accounting and management. Other topics will include ERP implementation issues, change management, and business process reengineering. Course material will include hands-on exercises using SAP R/3 Enterprise software. Prerequisite: C or better in ACCT 452 or BCIS 502 or consent of instructor.

BCIS 565. Enterprise Information Portals 3 cr.
Enterprise information portal (EIP) is a framework for integrating information, people and processes across organizational boundaries using web-based technologies. In this class, you will explore the wide range of options (EIP's) (e.g. SAP Netweaver Portal) provided to integrate ERP solutions, third-party applications, legacy systems, databases, unstructured documents, internal and external Web content, and collaboration tools. Taught with BCI 495. Prerequisite(s): BCIS 485.

BCIS 575. Management of Information Security 3 cr.
Provides management overview of information security and thorough examination of administration of information security. Surveys field of information security including planning, policy and programs, protection and people relative to information security. Prerequisite: BCIS 110 or equivalent. Same as BCIS 482.

BCIS 580. Systems Design, Development, and Implementation 3 cr.
Covers design, development and implementation of business information processing systems. Includes maintenance, evaluation and system management considerations. Prerequisite: either BCIS 350, BCIS 540, or consent of instructor. Same as BCIS 450 with differentiated assignments for graduate students.

BCIS 584. Object-Oriented Systems Development Techniques 3 cr.
Business information systems development in the object-oriented environment. Taught with BCIS 470 with differentiated assignments for graduate students. Prerequisite(s): C or better in BCIS 322 or consent of instructor.

BCIS 585. Design of On-Line Business Systems 3 cr.
Analysis, design, and development of on-line, real-time computerized business information systems. Taught with BCIS 455 with differentiated assignments for graduate students. Prerequisite(s): C or better in BCIS 322 or consent of instructor.

BCIS 586. Data Communications and Networks 3 cr.
Data communications for business computer systems, local area networks, data communications protocols and media, and client-server and distributed processing systems. Prerequisite: C or better in either BCIS 350 or BCIS 540, or consent of instructor. Same as BCIS 460 with differentiated assignments for graduate students.

BCIS 587. Business Systems Simulation 3 cr.
Simulation of business systems. Model design, implementation, testing, and analysis. Taught with BCIS 465 with differentiated assignments for graduate students. Prerequisite(s): C or better in BCIS 322 or consent of instructor; and A ST 251 or STAT 251.

BCIS 590. E-commerce Security 3 cr.
Introduction to securing network-based applications from both internal and external threats. Fundamentals of network security including TCP/IP, firewalls, intrusion detection and vulnerability discussed. Not open to students who have taken BCIS 480. Prerequisites: C or better in BCIS 460 or consent of instructor. No S/U or audit option.

BCIS 595. Database Management Systems 3 cr.
Design, development, and use of database management systems in the business environment. Prerequisite: BCIS 350 or consent of instructor. Same as BCIS 475 with differentiated assignments for graduate students.

BCIS 598. Independent Study 1-3 cr.
Individual studies directed by consenting faculty with prior approval of department head. A maximum of 3 credits may be earned. Prerequisite: consent of instructor.

BUSINESS LAW

BLAW 490. Selected Topics	1-3 cr.
Prerequisites vary according to the seminar being offered.	
BLAW 498. Independent Study	1-3 cr.
Individual studies directed by consenting faculty with the prior approval of the department head. Prerequisites: junior or above standing and consent of instructor and department head.	
BLAW 502. Legal Environment of Business	3 cr.
Legal procedures and the judicial system as applied to business situations and a general coverage of the bodies of substantive law most commonly associated with business. Prerequisite: graduate students only.	
BLAW 518. Uniform Commercial Code and Advanced Business law Topics	3 cr.
Property, advanced contract law, debtor-creditor relations, bankruptcy and Uniform Commercial Code topics including sales, negotiable instruments, secured transactions and documents of title. Students who have taken either BLAW 318 or BLAW 418 may not receive credit for BLAW 518. Prerequisites: BLAW 316 or BLAW 502.	
BLAW 527. Negotiation and Business Dispute Resolution	3 cr.
Focus on learning tactics related to conflict resolution skills and negotiation theory. Also the use of quantitative methods and their realistic application in resolving disputes. Students will participate in numerous role playing activities and simulated mediation games. Same as MGT 527.	
BLAW 550. Selected Topics	3 cr.
Seminars in selected topics related to business law or the legal environment of business. Prerequisite(s): Varies according to seminar being offered.	
BLAW 598. Special Research Programs	1-3 cr.
Individual investigations either analytical or experimental with the prior consent of the instructor and department head. Prerequisite: consent of instructor and department head.	

ECONOMICS

Descriptions for the following courses may be found under the section "Economics and International Business" later in this chapter.

ECON 450V. International Economics	3 cr.
ECON 453. Introduction to Health Services Policy	3 cr.
ECON 455. Public Utilities Regulation	3 cr.
ECON 457. Mathematical Economics	3 cr.
ECON 458. Development of Economic Thought	3 cr.
ECON 460. Intelligence Research and Analysis	3 cr.
ECON 465. Economics of Human Resources	3 cr.
ECON 489. Senior Economics Seminar	3 cr.
ECON 490. Selected Topics	1-3 cr.
ECON 498. Independent Study	1-3 cr.
ECON 503. Managerial Economics	3 cr.
ECON 545. Econometrics II	3 cr.
ECON 550. Special Topics	1-3 cr.
ECON 571. Regulatory Policy and Industry Analysis: Electricity I	3 cr.
ECON 572. Regulatory Policy and Industry Analysis: Water and Natural Gas	3 cr.
ECON 573. Regulatory Policy and Industry Analysis: Electricity II	3 cr.
ECON 574. Advanced Seminar Regulatory Policy and Industry Analysis	3 cr.
ECON 581. International Economics	3 cr.
ECON 582. Economics of Health Care	3 cr.

FINANCE

FIN 456. Real Estate Investments and Financing	3 cr.
Basic considerations for real estate investment and financing in local, state, and national markets. Prerequisite: FIN 325 or BLAW 325 or consent of instructor.	
FIN 466. Financial Policy Decisions	3 cr.
Application and integration of financial theory, concepts, and practice using the case method. Prerequisite: FIN 406 or consent of instructor.	
FIN 470. Real Estate Appraisal	3 cr. (2+2P)
This course addresses issues influencing the value of real estate with some emphasis upon rural properties. Topics include courthouse records, property taxes, appraisal methodology, expert courtroom testimony, condemnation, and legal issues. Students will take field trips and write appraisals. Course material is relevant to student in Finance, Accounting, and Pre-Law, as well as Agriculture. Accredited for hours to apply to both pre-licensing and continuing education requirements of the New Mexico Real Estate Commission for both Appraisers and Real Estate Brokers. Prerequisite(s): Junior or above standing. Crosslisted with: AG E 470.	

FIN 475. International Managerial Finance	3 cr.
International aspects of financial transactions, decision-making, banking and financial markets. Prerequisite: FIN 341. Same as I B 475.	
FIN 480. Management of Financial Institutions	3 cr.
Asset and liability management of financial institutions; emphasis on commercial bank management. Prerequisite: FIN 385 or consent of instructor.	
FIN 490. Selected Topics	1-3 cr.
Current topics in finance. Prerequisites: vary according to the seminar being offered.	
FIN 491. Finance Internship and Cooperative Education II	1-3 cr.
Advanced application of finance techniques to the work environment. Prerequisite: consent of instructor. Restricted to finance majors.	
FIN 498. Independent Study	1-3 cr.
Individual studies directed by consenting faculty with the prior approval of the department head. Prerequisites: junior or above standing and consent of instructor. A maximum of 3 credits may be earned.	
FIN 503. Financial Management	3 cr.
Theory and application of financial analysis to asset management, project evaluation, capital structure, and dividend policy. Interrelationships among financial and other organizational decisions. Prerequisite(s): FIN 341 with a grade of B or better.	
FIN 511. Financial Futures Markets	3 cr.
Same as AEEC 511.	
FIN 521. Personal Financial Planning for Professionals	3 cr.
Introduction to personal financial planning, including goal setting and fact finding, cash management, credit, housing, retirement planning, taxation and estate planning. This course is intended for those planning careers in personal financial advising in one of the various financial services environments. Prerequisite(s): FIN 503, or consent of Instructor.	
FIN 525. Financial Statement Analysis and Valuation	3 cr.
Financial statement analysis from the perspective of equity investors, creditors and company managers. Using a fundamental analysis approach, the primary objectives are development of financial statement analysis skills used in firm and stock valuation, as well as enhancement of skills in credit analysis and strategic firm management. Prerequisite: FIN 503 and ACCT 503. Graduate students only.	
FIN 535. Investment Concepts	3 cr.
Investments in common stocks and other securities. Risk and return, securities markets, portfolio theory and management. Prerequisite: FIN 503.	
FIN 536. Applied Security Analysis and Portfolio Management	1-3 cr.
Application of analytical tools to security selection and portfolio management. Prerequisite(s): FIN 435 or FIN 535.	
FIN 545. Money and Capital Markets	3 cr.
Examination of financial markets and institutions. Emphasis on interest rate determinants, bond markets, and fixed income portfolio management. Prerequisite: FIN 503.	
FIN 555. Derivative Markets and Securities	3 cr.
Institutional aspects of derivative markets and the arbitrage based pricing of derivative instruments such as stock options, interest rate options, future contracts and swaps. The applied component of the course demonstrates use of these instruments as hedge and/or investment vehicles. Prerequisite(s): FIN 503.	
FIN 566. Advanced Financial Management	3 cr.
Application and integration of financial theory, concepts, and practice using the case method. Prerequisite: FIN 503.	
FIN 575. International Managerial Finance	3 cr.
International aspects of financial transactions, decision-making, banking and financial markets. Prerequisite: FIN 503.	
FIN 581. Management of Financial Institutions	3 cr.
Asset and liability management of financial institutions; emphasis on commercial bank management. Pre/Corequisite(s): FIN 385 or FIN 503.	
FIN 590. Selected Topics	1-3 cr.
Current topics in finance. Taught with FIN 490 with differentiated assignments for graduate students. Consent of instructor required.	
FIN 598. Special Research Programs	1-3 cr.
Directed individual reading or research. Prerequisite: consent of instructor.	

INTERNATIONAL BUSINESS

Descriptions for the following courses may be found under the section "Economics and International Business" later in this chapter.

I B 450V. International Economics	3 cr.
I B 458. Comparative International Management	3 cr.
I B 475. International Finance	3 cr.
I B 489. Senior Seminar in International Business	3 cr.

MANAGEMENT

MGT 451. Selection, Placement, and Performance Evaluation	3 cr.	
Staffing processes for organizations and the evaluation of employee performance. Use of selection methods and measurement of work behavior.		
MGT 453. Leadership and Motivation	3 cr.	
Theories of leadership and motivation. Motivational programs for complex organizations. Relationships between organizational power, authority, and management styles. Crosslisted with: I E 453		
MGT 454. Work Teams in Organizations	3 cr.	
Theories of small groups and their application to the work situation. Why and how groups form, grow, communicate, and maintain themselves. Prerequisites: senior or above standing.		
MGT 455. Public Utilities Regulation	3 cr.	
Same as ECON 455.		
MGT 457. Management of Health Services Organizations	3 cr.	
Background and trends in health service delivery, organization structure, planning, control, staffing, decision making, behavioral and legal aspects. Prerequisite: MGT 309 or equivalent.		
MGT 458. Comparative International Management	3 cr.	
Cultural influences on management are examined in a global business environment with a particular emphasis on human behavior in multinational organizations and the management of human resources. Same as I B 458.		
MGT 460. Compensation Management	3 cr.	
An overview of wage and salary administration, including job evaluation, wage and salary surveys, program administration, legal aspects of pay systems, and benefits administration. Prerequisite(s): MGT 332 or consent of instructor.		
MGT 461. Seminar in Entrepreneurship	3 cr.	
For students interested in owning and operating their own business; students desiring hands-on, real-time experience in helping start up a business. Prerequisites: seniors in business administration or engineering, MBA students and others at the discretion of the instructor. Same as MKTG 461.		
MGT 462. Introduction to Health Services Policy	3 cr.	
Same as ECON 453.		
MGT 464. Entrepreneurship Laboratory	3 cr.	
Development and implementation of a business plan for a new venture. Includes feasibility study.		
MGT 465. Contemporary Issues in Human Resources Management	3 cr.	
Integrative course in human resources management, emphasizing the application of advanced concepts to complex personnel cases. Prerequisite: MGT 332.		
MGT 466. Managing Electronic Commerce: A Business Models Perspective	3 cr.	
Surveys the emerging Internet technology involving business to business, business to consumer, and consumer to consumer forms of trade. Covers quantitative decision and negotiation analysis techniques as well as auction and market trade mechanisms.		
MGT 470. Project Management in Organizations	3 cr.	
Roles, responsibilities, and techniques of project managers in managing projects effectively. Preparation for professional certification.		
MGT 480. Operations Strategy	3 cr.	
The formulation and implementation of integrated operations plans as strategic as well as tactical means to organizational competitiveness. Integration of the operations management course sequence with the companion functional areas of business is achieved via the case method and a system design project.		
MGT 490. Selected Topics	1-18 cr.	
Seminars in selected current topics in the various areas of management and administration. Prerequisites vary according to the seminar being offered.		
MGT 491. Management Internship and Cooperative Education II	1-3 cr.	
Covers the application of management skills to the work environment. The amount of academic credit (1-3 cr.) will be determined by the academic experience and not be the work experience. Prerequisite: MGT 309 and consent of instructor. May be repeated for a maximum of 3 credits. Restricted to majors and minors.		
MGT 498. Independent Study	1-3 cr.	
Individual studies directed by consenting faculty with the prior approval of the department head. Prerequisites: junior or above standing and consent		
of instructor. A maximum of 3 credits may be earned.		
MGT 502. Operations Management	3 cr.	
Systems and specialized models applied to the management of production facilities and service operations, including physical and human resources. Prerequisite(s): Graduate students only.		
MGT 503. Organizational Behavior and Management Processes	3 cr.	
Covers the theory and practice related to the successful management of human resources in organizations operating within a dynamic global environment. Course goals include developing alternative frameworks for analyzing issues related to human behavior, management science, and organizational structure and theory. Prerequisite: graduate students only.		
MGT 512. Quantitative Analysis for Business Decisions	3 cr.	
Identification, collection, and analysis of an organization's data both internal and external, and use of the resultant information in managerial decision making. Prerequisite: graduate students only.		
MGT 524. Human Resource Management	3 cr.	
Employment planning, recruiting, selection, orientation, performance evaluation, training, compensation, employee benefits, health and safety, equal employment opportunity, labor relations, and discipline.		
MGT 527. Negotiation and Business Dispute Resolution	3 cr.	
Same as BLAW 527.		
MGT 545. Seminar in Human Resources Management	3 cr.	
Systems, theories, and methods of managing human resources for optimum productivity.		
MGT 548. Small Business Consulting	3 cr.	
Study, analysis, and presentation of recommendations for solving significant problems confronting small businesses. Same as MGT 448 with differentiated assignments for graduate students.		
MGT 550. Special Topics	3 cr.	
Seminars in selected current topics in the various areas of management. Prerequisites vary according to seminar being offered.		
MGT 555. Experiential Approaches to Management and Organization Development	3 cr.	
Experience-based learning methods for managerial training and organization development, leadership and human relations training, and personal growth and development.		
MGT 581. Selection, Placement, and Performance Evaluation	3 cr.	
Staffing processes for organizations and the evaluation of employee performance. Use of selection methods and measurement of work behavior. Prerequisite: MGT 332 or consent of instructor. Same as MGT 451 with differentiated assignments for graduate students.		
MGT 583. Leadership and Motivation	3 cr.	
Theories of leadership and motivation. Motivational programs for complex organizations. Relationships between organizational power, authority, and management styles. Same as MGT 453 with differentiated assignments for graduate students.		
MGT 584. Work Teams in Organizations	3 cr.	
Theories of small groups and their application to the work situation. Why and how groups form, grow, communicate, and maintain themselves. Prerequisites: graduate standing. Same as MGT 454 with differentiated assignments for graduate students.		
MGT 585. Public Utilities Regulation	3 cr.	
Same as MGT 455 with differentiated assignments for graduate students. Same as ECON 585.		
MGT 587. Management of Health Service Organizations	3 cr.	
Background and trends in health service delivery, organizational structure, planning, staffing, decision making, behavioral and legal aspects. Same as MGT 457 with differentiated assignments for graduate students.		
MGT 588. Comparative International Management	3 cr.	
Covers human resource management in other countries, with emphasis on Mexico, Western Europe, and Japan. Examination of cultural influences on management systems. Prerequisite: consent of instructor. Same as MGT 458 with differentiated assignments for graduate students.		
MGT 589. Global Agribusiness Environment	3 cr.	
Covers the integration of free trade, social equity, environmental and transnational corporation's aspects of agribusiness from a food and global market perspective and within the framework of open systems theory, the socio-ecological perspective (CSTE). Prerequisite: Graduate students only.		
MGT 590. Strategic Management	3 cr.	
Covers the integration of functional, human, technological, and environmental aspects of business within the framework of management policy and strategy formulation. Formulate, implement, evaluate and control the various functions of the organization from a systems perspective. Understand the external environment and its impact on the organization. Prerequisite: M.B.A. student in his or her final semester. Restricted to majors.		

MGT 591. Seminar in Entrepreneurship	3 cr.
For students interested in owning and operating their own business; students desiring hands-on, real-time experience in helping start up a business. Prerequisite: M.B.A. student or consent of instructor. Same as MGT 461 with differentiated assignments for graduate students. Crosslisted with: MKTG 591.	
MGT 592. Compensation Management	3 cr.
An overview of wage and salary administration, including job evaluation, wage and salary surveys, program administration, legal aspects of pay systems, and benefits administration. Prerequisite: consent of instructor. Same as MGT 460 with differentiated assignments for graduate students.	
MGT 595. Contemporary Issues in Human Resources Management	3 cr.
Integrative course in human resources management, emphasizing the application of advanced concepts to complex personnel cases. Same as MGT 465 with differentiated assignments for graduate students.	
MGT 596. Seminar in Quality and Productivity	3 cr.
In-depth analysis and use of quality and productivity tools to continuously improve manufacturing and service operations. In addition, quality standards such as ISO 9000 and the Malcolm Baldrige Award are reviewed. Comprehensive individual and team project assignments. Prerequisites: Introductory statistics and MGT 502 or equivalent.	
MGT 597. Seminar in Operations Strategy	3 cr.
In-depth analysis of the formulation and implementation of integrated operations plans as both strategic and tactical means to organizational competitiveness. Heavy emphasis on case analysis and individual comprehensive operations design projects in manufacturing or service environments. Prerequisite: MGT 502 or equivalent. Same as MGT 480 with differentiated assignments for graduate students.	
MGT 598. Special Research Programs	1-3 cr.
Individual investigations either analytical or experimental. Prerequisite: consent of instructor. A maximum of 6 credits may be earned.	
MGT 600. Doctoral Research	1-88 cr.
This course number is used for assigning credit for research performed prior to successful completion of the doctoral qualifying examination. Restricted to management majors.	
MGT 601. Research in Management	1 cr.
Ph.D. course provides opportunities for significant interaction between Management faculty and Management Ph.D. students. The course also provides opportunities for development of professional scholarly standards, ethics, and critiques, as well as insight into current research areas and topics supported by the Management Department and other relevant disciplinary areas. May be repeated for a maximum of 6 credits. Restricted to Ph.D. students. Graded S/U.	
MGT 640. Instructional Development for Teaching Business	3 cr.
Pedagogical issues and techniques in collegiate business education. Includes course and curriculum development, outcomes assessment, class management, and teaching techniques. Practical issues faced in college instruction. Restricted to doctoral students.	
MGT 645. Seminar in Human Resources Management	3 cr.
Seminar will address current issues in human resources management. Focus on research related to the selection, development, and effective use of human resources. Restricted to doctoral students.	
MGT 650. Seminar in Organizational Behavior	3 cr.
Seminar will include specific organizational behavior topics; motivation, leadership, group and inter-group relations, and attitude theory. Focus on current research and theory. Restricted to doctoral students.	
MGT 655. Seminar in Organizational Systems and Theory	3 cr.
Analysis of organizations from a macro perspective. Topics include organizational theory, organizational design, organizational environment, and sociotechnical systems. Restricted to doctoral students.	
MGT 660. Research Design and Methodology	3 cr.
Topics will include philosophy of science, theory building, and research methods applicable to the study of organizational behavior. Restricted to doctoral students.	
MGT 661. Qualitative Research Methods	3 cr.
In-depth coverage of selected topics in research methodology, including theory and logic of scientific investigation, grounded theory, action research, and ethnomethodology. Restricted to doctoral students.	
MGT 670. Seminar in Operations Management	3 cr.
Seminar examines the major problem areas, research findings, and research methodologies of operations management. Focus on the critical evaluation of current theory and methodology. Restricted to doctoral students.	
MGT 675. Seminar in Strategic Management	3 cr.
Survey of current and classical readings in strategy. Introduces the doc-	

toral level student to strategic issues, strategic topics for research, and publication venues. Restricted to doctoral students.

MGT 685. Story Consulting to Organizations	3 cr.
Apply various qualitative story and narrative research methods (plot analysis, script analysis, life history, and restoring) to action research consulting project. Students will conduct story assessment and (propose or enact) intervention with a local consenting organization. Restricted to doctoral students.	
MGT 690. Special Topics	3 cr.
Seminars in selected current topics in the various areas of management. May be repeated for unlimited credit. Restricted to doctoral students. Prerequisite(s): Vary according to seminar being offered.	
MGT 698. Special Topics	1-3 cr.
Prerequisite: consent of instructor.	
MGT 700. Doctoral Dissertation	0-88 cr.
Prerequisite: advancement to candidacy.	

MARKETING

MKTG 451. Agribusiness Market Planning	3 cr.
Same as AG E 451.	
MKTG 454. Sports Marketing	3 cr.
The application of marketing concepts to the sports industry. Topics include fans/customers, products, and promotions across a range of sports.	
MKTG 455. Services Marketing Management	3 cr.
How service organizations can grow and prosper through application of marketing. Analyzes nature of services, service environment, customer and marketing mix, and implementation of service strategies.	
MKTG 457. Internet and Social Media Marketing	3 cr.
Focuses on the consumer psychology and marketing strategies at work in advertising and selling brands via the Internet and social media networks.	
MKTG 459. Promotion Management	3 cr.
Covers concepts and problems in the use of advertising, personal selling, publicity, and other forms of promotion; planning, coordination, control, and evaluation of effectiveness.	
MKTG 461. Seminar in Entrepreneurship	3 cr.
Same as MGT 461.	
MKTG 480. Level 3, PGA's PGM Education Program (Part 2)	1.5 cr.
Completion of Level 3 of the PGA's Educational Program. This class will focus on applying work experience while out on a PGA-required internship (co-op) to complete the PGA's Level education kit. Restricted to PGA Golf Mgt. students. Consent of PGA Director required. Consent of instructor required. Restricted to MKTG, PGM majors.	
MKTG 481. PGA Final Experience	3 cr.
The following is a requirement for successful completion of this senior level PGA Golf Mgt. capstone course: 16 months of co-op, completion of Level 1, Level 2, and Level 3 of the PGA's PGM Educational Program, and successful completion of the PGA's Playing Ability Test. Restricted to PGA Golf Mgt. students. Consent of PGA Director required. Consent of instructor required. Restricted to MKTG, PGM majors.	
MKTG 489. Strategy and Policy	3 cr.
Techniques and analysis of marketing strategy and policy planning and formulation. Prerequisites: senior standing or consent of instructor.	
MKTG 490. Selected Topics	1-18 cr.
Covers materials and subjects not offered in regular Marketing courses. Students can take 18 credit hours of MKTG 490 if each class is a different subtitle. A maximum of 18 credit hours can be earned through MKTG 490.	
MKTG 498. Independent Study	1-3 cr.
Individual studies directed by consenting faculty with the prior approval of the department head. Prerequisites: junior or above standing and consent of instructor. A maximum of 3 credits may be earned.	
MKTG 503. Marketing Management	3 cr.
Analysis of marketing problems and the integration of organizational resources as well as behavioral and quantitative techniques into the development and implementation of solutions. Prerequisite(s): MKTG 303 or equivalent with a grade of B or better. Graduate students only.	
MKTG 591. Seminar in Entrepreneurship	3 cr.
For students interested in owning and operating their own business; students desiring hands-on, real-time experience in helping start up a business. Same as MKTG 461 with differentiated assignments for graduate students. Crosslisted with: MGT 591.	
MKTG 598. Special Research Programs	1-3 cr.
Individual investigations either analytical or experimental. Prerequisite: consent of instructor. A maximum of 3 credits may be earned.	

MKTG 601. Marketing Management	3 cr.
Covers the conceptual foundations of contemporary marketing management research, concepts, and literature. Fundamental to the understanding of contemporary marketing and the breadth of the field of marketing study.	
MKTG 610. Marketing and the Scientific Method	3 cr.
Issues related to the evolution of research philosophies and methodologies. Critical to the development of appreciation for the value of research and experimentation.	
MKTG 620. Research- Theory Interface	3 cr.
Theoretical and methodological issues involved in translating a theory into a research study. Prepares Ph.D. students to undertake dissertation research. Consent of instructor required.	
MKTG 625. Consumer Behavior	3 cr.
Extensive reading of seminal and contemporary articles on consumer behavior and developing original research to explore cross-disciplinary issues relevant to the study of marketing.	
MKTG 630. Multivariate Analysis in Marketing	3 cr.
Understanding of what multivariate techniques can do, when and how they can be applied, and how results are interpreted, to enable students to read marketing literature with confidence. Prerequisites: consent of instructor and department head.	
MKTG 640. Measurement and Structural Equation Modeling	3 cr.
Explores theories of measurement that underlie all quantitative analysis, including the use of structural equation models. Contrasts classical test theory with item response theory and generalizability theory. Covers PRELIS and LISREL, and critiquing structural equation models by other researchers. Prerequisite: MKTG 630 or equivalent.	
MKTG 670. Marketing Theory	3 cr.
The evolution, development, construction, and evaluation of the major theoretical perspectives of marketing. Fundamental to the understanding of contemporary marketing and preparation for investigations into the nature and role of theory in marketing.	
MKTG 690. Special Topics in Marketing	3 cr.
A seminar on special topics in marketing. The topic of the course will vary according to the needs of the students in the program and the instructor. Ph.D. students may repeat this course up to three times for a maximum total of 9 credits.	
MKTG 698. Selected Topics	1-9 cr.
Materials and subjects not offered in regular marketing courses. May be repeated for a maximum of 18 credits under different subtitles.	
MKTG 700. Doctoral Dissertation	0-88 cr.
Prerequisite: advancement to candidacy.	

ECONOMICS AND INTERNATIONAL BUSINESS

Department website: <http://business.nmsu.edu/economics-ib>
(575) 646-2113
econgrad@cbae.nmsu.edu

Department of Economics and International Business: |

R. Adkisson, department head, Ph.D. (Nebraska) – international economics, public finance, institutional economics; Larry Blank, Ph.D. (University of Tennessee, Knoxville) – microeconomic theory, managerial economics and regulatory economics; K. Brook, Ph.D. (Texas-Austin)-macroeconomic theory, monetary policy; D. L. Clason, Ph.D. (Kansas State)-linear models, government statistics; D. L. Daniel, Ph.D. (Southern Methodist)-nonparametrics; M. Ellis (Emeritus), Ph.D. (California-Riverside) – comparative economic systems, medical economics; C. Enomoto, Ph.D. (Texas A&M)-econometrics, economic theory; C. A. Erickson, Ph.D. (Arizona State)-monetary theory, macroeconomics; D. A. Gegax, Ph.D. (Wyoming)-public utility economics, industrial organization; W. R. Gould, Ph.D. (North Carolina State)-biological sampling, wildlife and fisheries estimation; Y. L. Lee, Ph.D. (Southern Illinois-Carbondale) - international finance, international trade, international system, economic developments; B. N. Matta, (Emeritus) Ph.D. (Texas at Austin)- Economics; Randy McFerrin, Ph.D. (Texas A & M University) – micro theory, principles and American economic history; J. T. McGuckin, Ph.D. (Wisconsin-Madison)-production economics, resource economics and policy; A. D. J Mundfrom, Ph.D. (Iowa State)- general methods, multivariate statistics and linear models; J. T. Peach, Ph.D. (Texas-Austin)-quantitative economics, border studies, economic development; A.V. Popp, (Emeritus), Ph.D.,

(Northern Illinois)- public finance; D.B. Smith, (Emeritus), Ph.D. (Nebraska)- public utility economics, industrial organization; R. L. Steiner, Ph.D. (Oklahoma State)-likelihood methods, discrete distributions; C. M. Starbuck, Ph.D. (University of New Mexico) – environmental/resource economics, development, international business; D. VanLeeuwen, Ph.D. (Oregon State)-statistics; B. Widner, Ph.D. (Colorado State) – urban/regional, public finance, development; E. S. Willman, (Emeritus) Ph.D. (Indiana)-monetary policy, macroeconomic theory

Department of Agricultural Economics and Agricultural Business:

Terry L. Crawford, interim department head, Ph.D. (Cornell University) - marketing, policy and pricing, quantitative methods, trade; R. N. Acharya, Ph.D. (Auburn University) - food safety, logistics management, technology adoption, and marketing; L.B. Catlett, Ph.D. (Iowa State)- marketing, futures, economics; C. Clary, Ph.D. (North Carolina State) - marketing, commodity advertising; J. A. Diemer, Ph.D. (Colorado State)-natural resources, regional economics; C. Falk, Ph.D. (Oklahoma State)-marketing, agribusiness; J. M. Fowler, Ph.D. (Iowa State)-forestry and range economics; W. D. Gorman (Emeritus, Adjunct), Ph.D. (Oregon State)-agricultural business management, international marketing; J. Hawkes, Ph.D. (New Mexico State)-range management; B. H. Hurd, Ph.D. (California-Davis)-water and natural resource economics; J. D. Libbin, Ph.D. (Iowa State)-farm management, production economics; J. Lillywhite, Ph.D. (Purdue)-agribusiness marketing; M Patrick, Ph.D. (Michigan State)- Economic Development; Anil Rupasingha, Ph.D. (Texas A&M)- environmental and welfare economics, economic development; R. Skaggs, Ph.D. (Utah State)-agriculture and natural resource policy; L. A. Torell, Ph.D. (Utah State)- range, ranch economics, production economics; F. A. Ward, Ph.D. (Colorado State)-resource economics, welfare economics

DEGREE: Master of Arts

MAJOR: Economics

SPECIALIZATION: Public Utility Policy and Regulation

DEGREE: Doctor of Economic Development

GRADUATE STUDY IN ECONOMICS

The Department of Economics and International Business cooperates with the Department of Agricultural Economics and Agricultural Business in offering graduate programs in economics, agricultural economics, and economic development. The programs are jointly administered by faculty from the two departments. The objective of the master's programs is to prepare students for professional positions in business, government, or research institutions and/or for further graduate studies leading to the Ph.D. degree. The Department of Economics and International Business offers a Master of Arts in economics and, as subcategories of the degree, options in regulatory economics, policy analysis and econometrics. For more information on the Master of Science degree in agricultural economics, refer to the Agricultural Economics section in this catalog. The objective of the Doctor of Economic Development is to provide advanced training in applied economic development.

DEGREE: Master of Arts

MAJOR: Economics

Candidates for the Master of Arts in economics must successfully complete a minimum of 30 graduate credits, (options may require more than 30 graduate credits). Twenty- one of the credits must have one of the four following prefixes: AECC, ECON, ECDV, or AG E. Twenty- four of the credits must be associated with courses numbered 500 or above. All students must meet the requirements specified in the general regulations and requirements for admission to the Graduate School and to candidacy. Students preparing to enter the program are encouraged to complete the following: (a) one course in intermediate microeconomic theory and one course in macroeconomic theory with minimum grades of B; (b) one course in college-level calculus; and (c) one course in statistics, including simple regression. Those students not having completed these courses may be admitted with the requirement that the deficiencies be completed at the beginning of the graduate program. Those students interested in the option in regulatory economics are advised to complete two courses in college-level statistics.

All students in the program must successfully complete a minimum of 30 credits including the following core courses: AECC 501, AECC 502, and AECC 540.

For the option in Public Utility Policy and Regulation, students must also complete ECON 571, ECON 572, ECON 573, and ECON 574.

For the option in policy analysis, students must also complete the following courses: AEEC 522, AEEC 523, AEEC 524, GOVT 530, either a three-credit internship or AEEC 599 (3 credits), and 6 additional credits agreed upon with the advisor.

For the option in Econometrics, students must also complete the following courses: ECON 545 and 6 graduate credits of A ST (Applied Statistics) at the 500 level (excluding A ST 505).

Teaching and research assistantships are available to qualified applicants. It is not necessary to have a degree in economics to enter the graduate program or to receive financial assistance. An application and three letters of reference are required to be considered for any available assistantships. These forms can be obtained from the department.

DEGREE: Doctor of Economic Development

The Doctor of Economic Development (DED) is a professional doctorate designed to provide advanced training for economic development professionals. It is not designed to prepare graduates for academic careers.

Candidates for the DED enter the program with the equivalent of a master's degree. DED students must successfully complete 60 graduate credits beyond the hours required for entry. All students must meet the requirements specified in the general regulations and requirements for admission to the Graduate School and to candidacy. DED admission requirements include: (a) related master's degree or equivalent coursework; (b) one course in intermediate microeconomic theory and one course in intermediate macroeconomic theory with minimum grades of B; (c) one course in college-level calculus with a minimum grade of B; and (d) one course in statistics, including simple regression with a minimum grade of B. Additionally, students who have not completed graduate level courses in microeconomic theory, macroeconomic theory, and econometrics (AEEC 501, AEEC 502, AEEC 540) with grades of B or better will be required to successfully complete these courses early in the DED program.

All students in the DED program must successfully complete the following core courses: ECDV 550, ECDV 651, ECDV 661, ECDV 662, ECDV 664, ECDV 668, ECDV 671, and ECDV 692(twice). In addition, students will complete at least one specialty area (nine semester hours) and 12-15 semester hours of internship and final project, and sufficient elective credits to fulfill the 60 hour requirement. Intermediate and final comprehensive and oral exams will be given and will determine eligibility to continue in the program and/or to graduate.

Detailed and updated information is available on the departmental website.

GRADUATE STUDY IN BUSINESS ADMINISTRATION

The Department of Economics and International Business also cooperates with the other departments of the College of Business Administration and Economics in offering programs leading to a Master of Business Administration degree and a Ph.D. in business administration. Within the Ph.D. program, the department offers a minor area of study. More information about these programs is available in this catalog under "Business administration and Economics (College of)."

ECONOMICS

- ECON 450V. International Economics 3 cr.
Trade and capital flows between countries, international payments, government policy in balance-of-payments and tariff matters, international organizations. Prerequisite: ECON 201G or equivalent. Same as I B 450V.
- ECON 453. Introduction to Health Services Policy 3 cr.
The economics of health care policy in the United States with concern for U.S. Mexico border health issues and international comparisons. Same as MGT 462.
- ECON 455. Public Utilities Regulation 3 cr.
Procedures of utility regulation; regulatory theory applied to specific industries; commission regulation compared to public ownership and deregulation. Prerequisites: ECON 252G, FIN 306, or consent of instructor. Same as MGT 455.
- ECON 457. Mathematical Economics 3 cr.
Application of mathematical tools, especially the calculus, to economic theory. Prerequisite: one upper-division economics course.
- ECON 460. Intelligence Research and Analysis 3 cr.
This course explores the organization, functions, and processes of the U.S. Intelligence Community (IC), with focus on practical intelligence

research and analytical methods. Students will learn in-depth research techniques that will be valuable to any course of study. Critical thinking skills will be enhanced through the practice of analytical methods that can be applied toward national security and/or commercial interests. Unclassified and declassified data, including human intelligence, imagery, and other sources of evidence will be used in class projects and assignments. Intelligence successes and failures will be examined, as well as the politicization of intelligence and the relationship of intelligence activities to policy and policymakers. Prerequisite: Junior status or above.

- ECON 465. Economics of Human Resources 3 cr.
Measurement, allocation, and utilization of human resources; labor supply, value of education and training, labor market dynamics, unemployment, government manpower programming.
- ECON 489. Senior Economics Seminar 3 cr.
Seminar primarily for economics majors in their final semester. Provides an opportunity to apply economic theory to a broad variety of topics. Prerequisite: ECON 371 or ECON 372.
- ECON 490. Selected Topics 1-3 cr.
Current topics in economics. Subject matter to be designated for each semester.
- ECON 498. Independent Study 1-3 cr.
Individual studies directed by consenting faculty with the prior approval of the department head. May be repeated for a maximum of 3 credits. Prerequisite: junior or above standing and consent of instructor.
- ECON 503. Managerial Economics 3 cr.
Theory and application of microeconomics to the management of organizations. Prerequisite(s): A ST 251 or 311 or equivalent with B or better.
- ECON 545. Econometrics II 3 cr.
Application of statistical techniques to estimation of economic relationships: demand functions, production and cost functions, and macroeconomic equations. Prerequisites: ECON 251, 252, STAT 251G or A ST 311, and AEEC 540.
- ECON 550. Special Topics 1-3 cr.
Seminars in selected current topics in the various areas of economics. Prerequisites vary according to the topic being offered.
- ECON 571. Regulatory Policy and Industry Analysis: Electricity I 3 cr.
Regulatory policy and economic analysis related to the Electric Industry. Topics include: characteristics of a utility and legal justification for regulation; characteristics and functions of a regulatory commission; history and structure of the industry; technology and network design; revenue requirements; cost allocation; and basic retail rate design. Prerequisite(s): ECON 252, FIN 306, or consent of instructor.
- ECON 572. Regulatory Policy and Industrial Analysis: Water and Natural Gas 3 cr.
Regulatory policy and economic analysis related to the Natural Gas and Water industries. Topics include: history and structure of the industry; technology and network design; revenue requirements; cost allocation; and retail rate design.
- ECON 573. Regulatory Policy and Industry Analysis: Electricity II 3 cr.
Regulatory policy and economic analysis related to the Electric industry. Topics include: optimal generation mix; ancillary services; environmental policies; rate case procedures and strategies for effective testimony; advanced retail rate design; wholesale exchanges; unbundled transmission tariffs; market institutions and how different markets function; state and federal deregulation policies; Federal Energy Regulatory Commission orders and policies; demand-side management; and regulatory treatment of non-traditional retail services. Consent of instructor required. Prerequisite(s): ECON 571 or consent of instructor.
- ECON 574. Advanced Seminar Regulatory Policy and Industry Analysis 3 cr.
Advanced seminar and writing course specializing in regulatory policy and regulatory casework. Topics Include: special policy & regulatory issues in telecommunications, electricity, natural gas, and water; preparation of written testimony; expert witness effectiveness including cross-examination; and contested case management. This course involves extensive reading and writing assignments. Consent of instructor required. Prerequisite(s): ECON 571 or consent of instructor.
- ECON 581. International Economics 3 cr.
Trade and capital flows between countries, international payments, government policy in balance-of-payments and tariff matters, international organizations. Prerequisite(s): ECON 201 or equivalent.
- ECON 582. Economics of Health Care 3 cr.
Analysis of the allocation of resources in the field of health and medical care. Taught with ECON 432V with differentiated assignments for graduate students.
- ECON 596. Independent Study 3 cr.
Individual study program. Each offering will cover a subtitle. Maximum of

3 credits in a semester and 6 credits in a program. Consent of instructor required.

ECONOMIC DEVELOPMENT

ECDV 550. Introduction to Local and Regional Development	3 cr.
Serves as the introductory course in the Doctor of Economic Development program. Overview of the economic development field.	
ECDV 590. Special Topics	1-3 cr.
Selected topics in the area of Economic Development. Subtitle reflects content. May be repeated up to 9 credits. Consent of instructor required.	
ECDV 596. Individual Study	1-3 cr.
Individual studies directed by consenting faculty with the prior approval of the Department Head. May be repeated up to 6 credits.	
ECDV 624. Seminar in Economic Development and the Public Sector	3 cr.
Explores specific examples of the interaction of public finance and economic development. Students examine actual cases and examples of the use of public finance policy to influence economic development. Prerequisites: AECC 522 and AECC 523.	
ECDV 651. Economic Development Theory	3 cr.
Builds upon a general understanding of microeconomic and macroeconomic theory to focus specifically on theories of economic development at all levels. Prerequisites: AECC 501 and 502	
ECDV 661. Regional Economic Modeling I	3 cr.
Provides an introduction to the basic tools and methods of regional economic development analysis. Prerequisite(s): AECC 501, AECC 502, and AECC 540.	
ECDV 662. Regional Economic Modeling II	3 cr.
Continuation of ECDV 661 with focus on more advanced tools and methods of regional economic development analysis.	
ECDV 664. Population Economics	3 cr.
Examines the causes and consequences of demographic change. Examines theories of basic demographic processes, population projection and estimation. Consent of instructor required.	
ECDV 666. Economics of Transportation	3 cr.
Regional implications of the economics of transportation systems. Explores the role of transportation in economic development. Consent of instructor required.	
ECDV 668. Economic Development Finance	3 cr.
Focuses on the tools and methods of economic development finance.	
ECDV 670. Research in Economic Development	3 cr.
Intense examination of the academic literature on economic development at all levels. Prerequisites: ECDV 651, ECDV 661 and ECDV 662.	
ECDV 671. Sustainable Economic Development	3 cr.
Focuses on the interconnections between economic development and the environment. Provides a broad set of tools and ideas related to the impacts of human activities on the environment. Prerequisites: AECC 501, AECC 502 and AECC 540.	
ECDV 673. Research Methods	3 cr.
An overview of alternative research methods and tools. Students explore quantitative and qualitative research methods as alternatives and complements to statistical methods. Research design, ethics, and presentation are emphasized. Prerequisites: AECC 501, AECC 502 and AECC 540.	
ECDV 681. Urban Economic Development	3 cr.
Examines causes and consequences of economic change in urban and metropolitan areas. Covers both theory and tools for analysis. Prerequisites: ECDV 651, ECDV 661 and ECDV 662.	
ECDV 682. Rural Development	3 cr.
Examines causes and consequences of economic change in rural areas, communities and small, open economies. Covers both theory and tools for analysis. Prerequisites: ECDV 651, ECDV 661 and ECDV 662.	
ECDV 683. Seminar in National Economic Development	3 cr.
Explores specific examples and cases of rural and urban economic development. Involves applied analysis of specific rural and/or urban economic issues/projects. Prerequisites: ECDV 681 and ECDV 682.	
ECDV 685. Seminar in International Economic Development	3 cr.
Explores specific examples and cases of economic development in an international context. Focuses on the application of theories and methods in prerequisite courses to the problems of nations lagging in economic development. Prerequisites: AECC 528, AECC 520 or ECON 581.	
ECDV 692. Seminar in Economic Development	3 cr.
Seminars in selected topics in economic development. Subtitle reflects content. May be repeated up to 9 credits. Prerequisite: Completion of at least nine semester hours of ECDV courses.	

ECDV 694. Internship 1-9 cr.
Internship in Economic Development. May be repeated up to 9 credits. Prerequisite: Completion of core requirements of Doctor of Economic Development.

ECDV 699. Doctoral Project 1-9 cr.
Doctoral Project. May be repeated up to 9 credits. Completion of all DED coursework and successful completion of comprehensive exams.

INTERNATIONAL BUSINESS

I B 450V. International Economics	3 cr.
Same as ECON 450V.	
I B 458. Comparative International Management	3 cr.
Cultural influences on management are examined in a global business environment with a particular emphasis on human behavior in multinational organizations and the management of human resources. Same as Mgt. 458.	
I B 475. International Finance	3 cr.
Same as FIN 475.	
I B 489. Senior Seminar in International Business	3 cr.
Capstone class for I B majors. Integration of previous classwork via the examination of case studies and completion of a major project. Prerequisite: I B core.	

AGRICULTURAL ECONOMICS AND ECONOMICS

Descriptions for the following courses may be found under the section "Agricultural Economics And Economics" at the beginning of this chapter.

AECC 501. Microeconomic Theory	3 cr.
AECC 502. Macroeconomic Theory	3 cr.
AECC 511. Advanced Futures and Options Markets	3 cr.
AECC 520. International Agricultural Trade Theory and Policy	3 cr.
AECC 522. Public Sector Economics I	3 cr.
AECC 523. Public Sector Economics II	3 cr.
AECC 528. Economic Development	3 cr.
AECC 540. Econometrics I	3 cr.
AECC 545. Advanced Agricultural Policy	3 cr.
AECC 550. Advanced Microcomputer Applications in Agriculture	3 cr. (2+2P)
AECC 551. Advanced Agribusiness Marketing	3 cr.
AECC 556. Advanced Agribusiness Management	3 cr.
AECC 575. Advanced Water Resource Management and Policy	3 cr.
AECC 580. Natural Resources and Environmental Policy	3 cr.
AECC 585. Production Economics	3 cr.
AECC 589. Global Agribusiness Environment	3 cr.
AECC 590. Special Topics	3 cr.
AECC 591. Agribusiness Management Seminar	1 cr.
AECC 593. Internship	1-6 cr.
AECC 594. Internship	1-6 cr.
AECC 595. Internship (f,s,su)	1-6 cr.
AECC 596. Individual Study	1-3 cr.
AECC 597. Non-Thesis Research Project	1-3 cr.
AECC 598. Creative Component Project	1-3 cr.
AECC 599. Master's Thesis	

AGRICULTURAL ECONOMICS

Descriptions for the following courses may be found under the section "Agricultural Economics And Economics" at the beginning of this chapter.

AG E 450. Advanced Microcomputer Applications in Agriculture	3 cr. (2+2P)
AG E 451. Agribusiness Market Planning	3 cr.
AG E 452. Food and Agricultural Products Marketing Research Techniques and Written and Oral Presentation Skill	3 cr.
AG E 456. Agribusiness Management	3 cr.
AG E 470. Rural Appraisal	3 cr. (2+2P)
AG E 475. Water Resource Management and Policy	3 cr.
AG E 491. Linear Programming Methods	1 cr.
AG E 499. Senior Thesis	3 cr.

COLLEGE of EDUCATION

Associate Dean • *Michael A. Morehead*

Associate Dean for Research • *Karin Wiburg*

Assistant Dean for Budget and Planning • *Gladys De Necochea*

Director of Education Research and Budget • *Wynn Egginton*

COUNSELING AND EDUCATIONAL PSYCHOLOGY

Department website: <http://education.nmsu.edu/cep/>
(575) 646-2121

J. P. Schwartz, Ph. D., department head, (New Mexico State University)- counseling psychology, gender roles, prevention, intimate violence; E. Adams, Ph.D., (Ohio State)-multiculturalism & diversity, career development, supervision; E. Arroyos, Ph.D. (Iowa)-school psychology, pediatric neuropsychology, mentoring, multicultural competence; H. Chun, Ph.D. (Missouri - Columbia) – school psychology, prevention of adolescent mental health and behavior problems,, risk and protective factors; I. Torres Fernandez, Ph.D. (Iowa)- school psychology, prevention, classroom guidance; G. Dickson, Ph.D. (Iowa) – counselor education, multicultural training ; L.L. Grayshield, Ph.D. (Nevada – Reno) – indigenous culture based methods in counseling & educational psychology; C. H. Huber, Ph.D. (South Carolina)-human development, cognitive-behavior therapy, family psychology; R. Navarro, Ph.D. (Missouri – Columbia)- career development, academic achievement of Latinos; E. Vazquez, Ph.D. (Iowa)-school psychology, assessment, psychoeducational interventions, acculturation, ethnic and linguistic diversity; L. Vazquez, Ph.D. (Iowa)-multicultural curriculum development and counseling, bilingual therapy, acculturation, identity development, and phenotype research; M. Waldo, Ph.D., (Utah)- counseling psychology, mental health counseling, relationship enhancement, group work, prevention.

DEGREE: Master of Arts

MAJOR: Counseling and Guidance

CONCENTRATION: Counseling

CONCENTRATION: Guidance and Human Relations

DEGREE: Specialist in Education

MAJOR: School Psychology

DEGREE: Doctor of Philosophy

MAJOR: Counseling Psychology

The major thrust of the Counseling and Educational Psychology (CEP) Department is the preparation of personnel for work in counseling , guidance, school psychology, counseling psychology, and related areas. Three graduate degrees are available: (1) Master of Arts, (2) Specialist in Education, and (3) Doctor of Philosophy.

The CEP Dept. offers a Counseling Program which leads to a Master of Arts in Counseling and Guidance. The program is accredited by the Council for Accreditation of Counseling and Related Educational Programs (CACREP). It prepares professional counselors to perform mental health counseling in agencies, hospitals, private practice and schools. Successful completion of the Counseling Program qualifies students to pursue licensure as clinical mental health counselors with the New Mexico Counseling and Therapy Practice Board and licensure as school counselors with the New Mexico Department of Education. The 60-credit counseling curriculum requires two years full time or three years part time study on campus, and covers the following areas: human development; appraisal; diagnosis; treatment planning; individual, family, and group counseling; consultation; career/life planning; addictions; research; and professional issues.

Specialized training and supervised experience is offered in mental health agencies, hospitals, and in schools.

The CEP Dept. also offers a Specialization in Guidance and Human Relations that leads to a Master of Arts in Counseling and Guidance. It prepares professionals for guidance roles in the military, education, community agencies, corrections and other settings. The thirty credit guidance curriculum can be completed in two years of part time study. It is offered primarily through distance education, but includes some face to face instruction on campus. The Specialization in Guidance and Human Relations does not prepare students for licensure as counselors, and is not accredited by the Counsel for Accreditation of Counseling and Related Educational Programs.

The CEP Dept. offers a School Psychology Program that leads to an Educational Specialists (Ed. S.) degree in School Psychology. The program has national approval through the National Association of School Psychologists. The program provides additional education beyond the M.A. to prepare professionals for licensure as school psychologists in New Mexico and throughout the United States. The School Psychology Program prepares its candidates to work with preschoolers, children, adolescents, and families. The various settings where School Psychologists are employed include public schools and other organizations that require advanced assessment, counseling, consultation and other interventions. The program trains its candidates to serve students with diverse educational, psychological, and emotional needs from various backgrounds. Such training also includes working with all school personnel to help make education a positive and rewarding experience for their students. Currently, the program offers additional training for the development of bilingual School Psychologists through a personnel preparation grant.

The CEP Dept. offers a doctoral Counseling Psychology Program that leads to a Ph.D. in Counseling Psychology. The program is accredited by the American Psychological Association (for more information on this accreditation contact the Office of Program Consultation and Accreditation, APA, 750 1st Street, NE, Washington, DC 20002, 202.336.5979). The program is based on the scientist-practitioner model through which both research and service delivery skills are acquired. Graduates of the program are prepared to conduct research, provide service, teach, and supervise. The program prepares students for licensure as psychologists. The three goals of the program are to:

- 1) Produce well-trained generalists in applied psychology capable of competently utilizing a wide variety of assessments, modalities, and types of interventions; and in disseminating psychological information.
- 2) Nurture active learners and critical/scientific thinkers capable of integrative thinking, application of theory, hypothesis generation, and self-reflection, and
- 3) To develop in students a contextual understanding of psychology and the environments in which they work and live so as to produce culturally-responsive, developmentally-aware, and strengths-based psychology professionals.

CEP faculty conducts periodic reviews of students' progress in the programs, including their academic performance, counseling and psychoeducational skills, professionalism, and ethics. An interview is required as part of the review. Deficits identified through faculty reviews may result in recommendations that students engage in remedial work or that they pursue alternative career goals.

For information on admission procedures and requirements of degree programs in Counseling and Educational Psychology, contact the department office. Test scores on the Graduate Record Examination (aptitude) are required of all applicants. Other requirements include but are not limited to the following:

application and fee, official transcripts, three letters of recommendation, letter of intent, statement of purpose, and list of completed upper-division and/or graduate course work related to counseling, school psychology, or counseling psychology. Interviews are required as a part of the selection process. For more information about the CEP Department and programs visit our website: <http://education.nmsu.edu/cep/>

COUNSELING AND EDUCATIONAL PSYCHOLOGY

- C EP 451V. Introduction to Counseling 3 cr.
Principles of counseling for nonmajors.
- C EP 455. Addictions Prevention and Recovery 3 cr.
Understanding addictions process, prevention, and recovery, including biological, interpersonal and sociological influences, and intervention strategies. Taught with C EP 555.
- C EP 461. Family Guidance 3 cr.
Systems based guidance procedures for enhancing family strengths and development, and application of family guidance procedures for prevention and remediation of problems. Taught with C EP 561.
- C EP 495. Psychology, Multiculturalism and Counseling 3 cr.
Understanding social identities such as race, ethnicity, sexual orientation, age, social class and spirituality as it relates to psychosocial development, academic achievement and counseling.
- C EP 499. Independent Study 1-6 cr.
Individual study directed by consenting faculty.
- C EP 503. Introduction to Counseling 3 cr.
Overview of counseling theory, techniques, ethics, and professional issues. Same as C EP 451V.
- C EP 504. Counseling Skills 3 cr.
Overview of counseling. Emphasis on developing listening skills and basic counseling strategies, and provision of psychoeducational services. Prerequisites: C EP 503 or consent of instructor.
- C EP 511. Edumetrics 3 cr.
The rationale, assumptions, theories, and techniques underlying descriptive statistics as applied to educational and psychological measurement and research. Intended primarily for post-master's students (e.g., Ed.S., Ed.D.). Prerequisite: consent of instructor.
- C EP 512. Human Development 3 cr.
Theory and research regarding cognitive, social, and emotional development across the lifespan with emphasis on enhancing human development. Prerequisite: C EP major or consent of instructor. Same as C EP 612 except for advanced level materials and experiential activities.
- C EP 515. Learning Theory 3 cr.
Survey and comparison of theory and research regarding human learning as they apply to development, education, and counseling. Prerequisite: C EP 512 or consent of instructor. Same as C EP 615.
- C EP 517. The Psychology of Multiculturalism 3 cr.
Understanding age, gender, ethnicity, socioeconomic status and culture in relation to human development, education, and counseling. Prerequisite: C EP 512 or concurrent enrollment or consent of instructor. Restricted to majors. Same as C EP 617 except for advanced-level materials and experiential activities.
- C EP 519. Psychology of Social Identities 3 cr.
Theory, research and practice from feminist and multicultural perspectives will examine the integration of social identities such as gender, sexual orientation, race, ethnicity, age, social class, spirituality, and ability in relation to counseling psychology. Prerequisite: C EP 512 or concurrent enrollment or consent of instructor. Same as C EP 619.
- C EP 522. Organization and Administration of School Counseling Services 3 cr.
Procedures for establishing and maintaining counseling programs in the schools. Professional and ethical issues in school counseling and group laboratory experience to enhance self-awareness and interpersonal skills for effective professional relationships. Prerequisite: consent of instructor. Restricted to majors.
- C EP 524. Professional Issues in Mental Health Counseling 3 cr.
History, roles, organizational structures, settings, ethics, standards, laws, and credentialing related to mental health counseling. Group laboratory experience to enhance self-awareness and interpersonal skills for effective professional relationships. Prerequisite: consent of instructor. Restricted to majors.
- C EP 532. Research Methods 3 cr.
Develop research and program evaluation including critical literature review, generating questions, quantitative and qualitative methodology, analysis, and writing proposals.
- C EP 542. Appraisal Theory and Technique 3 cr.
Selection, administration, and interpretation of tests and other assessment methods. Topics include reliability, validity, norms, cultural factors, and ethics related to appraisal. Prerequisites: C EP 512 and C EP 517, or consent of instructor. Restricted to majors.
- C EP 547. Appraisal of Cognitive Functioning 3 cr.
Selection, administration, scoring, interpretation, and report writing using individual tests of intelligence. Moderator variables, such as acculturation, ethnic identity development, and world view are also incorporated. Restricted to majors. Taught with C EP 647. Consent of instructor required. Prerequisite(s): C EP 542 and consent of instructor.
- C EP 550. Counseling Theory and Technique 3 cr.
Major theories of counseling with an emphasis on development of the ability to offer theory-based counseling and consultation. Restricted to majors. Prerequisite(s): C EP 512, C EP 517, or concurrent enrollment, and consent of instructor.
- C EP 551. Diagnosis and Treatment Planning 3 cr.
Appraisal and conceptualization of mental disorders and other problems through diagnostic interviewing using the DSM. Treatment planning for counseling with children, adolescents, and adults. Prerequisite: C EP 512 or concurrent enrollment, or consent of instructor. Restricted to majors. Same as C EP 651.
- C EP 552. Career/Life Planning and Vocational Assessment 3 cr.
Vocational choice theories, relationship between career choice and life style, sources of occupational and educational information, and approaches to decision making and values clarification. Laboratory involves supervised interpretation of vocational assessment. Prerequisite: consent of instructor. Restricted to majors. Same as C EP 652.
- C EP 554. Counseling Theory and Techniques for School Psychologists 3 cr.
Major theories of counseling with an emphasis on development of the ability to offer theory-based counseling and consultation. Prerequisites: C EP 512, C EP 524, or concurrent enrollment, and consent of instructor. Restricted to majors.
- C EP 555. Addictions Prevention and Recovery 3 cr.
Understanding addictions process, prevention, and recovery, including biological, interpersonal and sociological influences, and intervention strategies. Taught with C EP 455.
- C EP 556. Addictions Counseling 3 cr.
Emphasis on alcohol and other psychoactive substance abuse. Also includes eating disorders, gambling, and other addictive behaviors. Covers review of psychopharmacology, assessment, and diagnosis with the major focus on treatment and professional issues. Prerequisite: C EP 550. Restricted to majors. Same as C EP 656.
- C EP 558. Child and Adolescent Counseling Theory and Technique 3 cr.
Counseling theory and technique applied to children and adolescents from a developmental perspective in school and mental health settings. Prerequisite: C EP 550 or consent of instructor. Restricted to majors. Same as C EP 658, except for advanced-level materials.
- C EP 561. Family Guidance 3 cr.
Systems based guidance procedures for enhancing family strengths and development, and application of family guidance procedures for prevention and remediation of problems. Taught with C EP 461.
- C EP 562. Family Therapy Theory and Technique 3 cr.
Major theories of family therapy and associated assessment, intervention and evaluation techniques. Restricted to majors. Taught with C EP 662 except for advanced-level materials and experiential activities. Consent of instructor required. Prerequisite(s): C EP 550.
- C EP 563. Primary Care Psychology 3 cr.
Didactic and experiential learning in primary care psychology issues. Through this course students will learn about the cultural necessity of the integration of mental and physical health issues and multidisciplinary collaboration. Restricted to majors. Consent of instructor required.
- C EP 566. Group Work Theory and Technique 3 cr.
Didactic and experiential learning in group theory and practice. Laboratory involves experiences in group participation and leadership. Prerequisite: C EP 550, C EP 562 or consent of instructor. Restricted to majors.
- C EP 572. Counseling Practicum 1-6 cr.
Supervised experience of counseling and consultation. Weekly individual and group supervision involves review of audio, video, and/or live sessions and case presentations. Prerequisites: C EP 550 and consent of instructor. Restricted to majors.
- C EP 578. Advanced Counseling Practicum 3-6 cr.
Supervised experience of appraisal and individual, family, and/or group counseling and consultation serving child, adolescent, and/or adult clients. Weekly individual and group supervision involves review of coun-

- selling sessions and case presentations. This course will carry a subtitle to reflect the practicum setting. Prerequisites: C EP 572, C EP 566, and consent of instructor. Restricted to majors.
- C EP 579. Clinical Psychopharmacology for Health Care Professionals 3 cr.
Basic principles of psychopharmacology, emphasizing applications to clinical populations and treatment implications. Prerequisite: consent of instructor. Restricted to M.A., Ph.D., and Ed.S. students.
- C EP 580. Counseling Internship 3-12 cr.
Supervised experience in a professional counselor role in a school or agency. Students perform all counselor functions including appraisal, individual/family/group counseling, consultation, administration, program development, research, and/or evaluation. To be taken during the final semester of coursework. Prerequisites: C EP 578 and consent of instructor. May be repeated for a maximum of 12 credits. Restricted to majors.
- C EP 584. School Counseling Internship 3-6 cr.
Supervised experience in school counseling. Prerequisite: consent of instructor. May be repeated for a maximum of 6 credits. Restricted to majors.
- C EP 598. Special Research Programs 1-6 cr.
Individual investigations either analytical or experimental. Maximum of 6 credits per semester and total of 9 credits overall. Restricted to majors.
- C EP 599. Master's Thesis 0-88 cr.
Thesis. Restricted to majors.
- C EP 600. Research 1-88 cr.
This course is used for assigning credit for research performed prior to successful completion of the doctoral qualifying examination. Restricted to majors.
- C EP 607. Curriculum-Based Assessment and Intervention 3 cr.
The study and practice of curriculum-based assessment and intervention for academic skills and problems among children and adolescents. Prerequisite: consent of instructor. Restricted to majors.
- C EP 608. Diagnostic Class 3 cr.
Emphasis on developing the knowledge, skills, and necessary application abilities related to diagnosis and associated interventions related to mental health and psychopathology issues that impact a student's ability to navigate the education setting. Prerequisite: consent of instructor. Restricted to majors.
- C EP 612. Human Development 3 cr.
Same as C EP 512 with differentiated assignments for Ph.D. students.
- C EP 616. Spanish for Mental Health Professionals 3 cr.
This course emphasizes the vocabulary for Mental Health Professionals to include academic, psychological and medical terminology. Students will incorporate Spanish terms in assessment and treatment plans through role plays. Further, the course will include an overview of the use of interpreters and translators in working with culturally and linguistically diverse clientele. Consent of instructor required. Prerequisite(s): Enrolled in Bilingual School Psychology Training Grant with instructor consent.
- C EP 619. Psychology of Social Identities 3 cr.
Same as C EP 519 with differentiated assignments for Ph.D. students.
- C EP 622. Ethical/Professional Issues in Counseling Psychology 3 cr.
History of counseling psychology, scientist-practitioner model, American Psychological Association's Ethical Principles of Psychologists and Code of Conduct. Focus on current ethical, professional, and scientific issues. Prerequisite: consent of instructor. Restricted to majors.
- C EP 624. Professional Issues in School Psychology 3 cr.
History, philosophy, and orientation of school psychology. Roles, technology, credentialing, community resources, school system issues, educational and psychology delivery service models, and current professional issues. Prerequisite: consent of instructor. Restricted to majors.
- C EP 625. Legal and Ethical Issues in School Psychology 3 cr.
Overview of legal/ethical, and professional standards in school psychology. NASP and APA codes of ethics, NM Mental Health and Children's codes, and child abuse/neglect laws. Prerequisite: C EP 624 and consent of instructor. Restricted to majors.
- C EP 627. Advanced Counseling Practicum II 1-6 cr.
Practicum experience supervised by a licensed psychologist. Assigned readings are designed to help the student more fully integrate theoretical approach in preparation for counseling psychology internship. Prerequisite: C EP 625 and consent of instructor. May be repeated for a maximum of 12 credits. Restricted to majors.
- C EP 630. School Psychology Research 3 cr.
Survey and analysis of research and program evaluation procedures in school psychology. Critical review of literature, formulating questions, quantitative and qualitative methodology, and data analysis as foundations for reading research literature and generating research, program evaluation, and/or grant proposals. Prerequisite: school psychology major or consent of instructor. Restricted to majors.
- C EP 632. Counseling Psychology Research 3 cr.
Survey and analysis of research and program evaluation procedures in counseling psychology. Critical review of literature, formulating questions, quantitative and qualitative methodology, and data analysis are covered as a foundation for reading research literature and generating research, program evaluation, and/or grant proposals. Prerequisite: C EP major or consent of instructor.
- C EP 636. Advanced Measurement and Statistics 3 cr.
Advanced methods for analysis of educational and psychological data. Prerequisite: C EP 511 or equivalent course work.
- C EP 637. Multivariate Research Procedures and Analyses 3 cr.
Design, conduct, and analyze multivariate research in education and psychology. Special attention given to the use of the statistical package in the management and analysis of data. Prerequisites: C EP 636 or equivalent course work.
- C EP 647. Appraisal of Cognitive Functioning 3 cr.
Restricted to majors. Taught with C EP 547 with differentiated assignments for doctoral students. Consent of instructor required.
- C EP 648. Appraisal of Personality 3 cr.
Selection, administration, scoring, interpretation, and report writing using major objective and projective tests of personality. Same as C EP 548 with differentiated assignments for Ph.D. students. Restricted to majors.
- C EP 651. Diagnosis and Treatment Planning 3 cr.
Prerequisite: C EP 612 or consent of instructor. Restricted to majors. Same as C EP 551 with differentiated assignments for Ph.D. students.
- C EP 652. Career/Life Planning and Vocational Assessment 3 cr.
Restricted to majors. Same as C EP 552 but with differentiated assignments for Ph.D. students.
- C EP 658. Child and Adolescent Counseling Theory and Technique 3 cr.
Prerequisite: C EP 550 or consent of instructor. Restricted to majors. Same as C EP 558 with differentiated assignments for Ph.D. students.
- C EP 662. Family Therapy Theory and Technique 3 cr.
Restricted to majors. Taught with C EP 562 with differentiated assignments for Ph.D. students. Consent of instructor required. Prerequisite(s): C EP 550 and consent of instructor.
- C EP 670. Behavioral Health Practicum 1-6 cr.
An intensive supervised experience in providing behavioral health services at an on or off campus interdisciplinary health setting. Supervision provided by doctoral level psychologist faculty in collaboration with other team disciplines' supervising faculty involves audio, video, and/or live observation of counseling sessions and team interventions and case presentations. Graded S/U.
- C EP 671. Consultation 3 cr.
Didactic and experimental trainings in theory-based consultation. Supervision provided by faculty involves audio, video, and/or live observation consultation activities and case presentations. Prerequisites: C EP 672, C EP 675, or C EP 678; and consent of instructor. Restricted to majors.
- C EP 672. Practicum in School Psychology: Psychoeducational 1-6 cr.
Supervised practicum in psychological and educational evaluation. Skill development in ecological assessment, including interviewing, observations micro-counseling, acculturation, world view, and ethnic identity formation. Restricted to majors. S/U grading option only. Prerequisites: C EP 647, SPED 505 and consent of instructor.
- C EP 673. Counseling Psychology Theory/Practicum 1-6 cr.
Theories of counseling and psychotherapy and their application during supervised counseling with clients. Supervision provided by doctoral psychologist faculty involves audio, video, and/or live observation of counseling sessions and case presentations. Prerequisite: consent of instructor. Restricted to majors.
- C EP 674. Appraisal Practicum 1-6 cr.
An intensive supervised experience in psychological assessment at a school or agency. Supervision provided by doctoral psychologist faculty involves audio, video, and/or live observation of appraisal procedures and case presentations. Restricted to majors. Consent of instructor required. Prerequisite(s): C EP 648 and consent of instructor.
- C EP 675. Practicum in School Psychology: Psychological 1-6 cr.
School-based supervised experience for the advanced student. Provides experiences in various roles and models of service delivery (group, multi-factored, integrative, family assessments) expected of school psychologists. Restricted to majors. S/U grading option only. Prerequisites: C EP 672 and consent of instructor.
- C EP 677. Group Work Theory/Practicum 1-6 cr.
Application of theory in group work with clients and in supervising group

- leaders in training. Supervision provided by doctoral psychologist faculty involves audio, video, and/or live observation of counseling sessions and case presentations. Prerequisites: C EP 676 and consent of instructor. Restricted to majors.
- C EP 678. Advanced Counseling Psychology Practicum 1-6 cr.
Supervised counseling psychology experience including appraisal, diagnosis, case conceptualization, treatment planning, theory-based counseling and evaluation. Supervision provided by doctoral psychologist faculty involves audio, video, and/or live observation of counseling sessions and case presentations. Prerequisites: C EP 677 and consent of instructor. May be repeated for a maximum of 12 credits. Restricted to majors. Graded S/U.
- C EP 679. Supervision Theory and Practicum 1-6 cr.
Didactic and experimental training in theory-based supervision. Supervision provided by doctoral psychologist faculty involves audio, video, and/or live observation of supervision sessions and case presentations. May be repeated for a maximum of 6 credits. Prerequisites: C EP 675 or C EP 678; and consent of instructor. Restricted to majors.
- C EP 680. Internship in Counseling Psychology I 1-18 cr.
Full-time equivalent of one-half calendar year of internship preferably in an APA-approved or APA-equivalent site. Available to Ph.D. students who have successfully completed their comprehensive exams. Prerequisite: consent of instructor. May be repeated for a maximum of 18 credits. Restricted to majors.
- C EP 682. Internship in Counseling Psychology II 1-18 cr.
Full-time equivalent of one-half calendar year of internship preferably in an APA-approved or APA-equivalent site. Available to Ph.D. students who have successfully complete their comprehensive exams. Prerequisite: consent of instructor. May be repeated for a maximum of 18 credits. Restricted to majors.
- C EP 684. Internship in School Psychology 1-12 cr.
Supervised experience in school psychology. May be repeated for a maximum of 12 credits. Consent of instructor required. Graded: S/U. Prerequisite(s): C EP 672, C EP 675. Restricted to School Psychology (SPSY) majors.
- C EP 686. Internship in Educational Psychology 3-12 cr.
Internship in either counselor education or college teaching. Course subtitled. Prerequisite: consent of instructor. May be taken for a maximum of 12 credits. Restricted to majors.
- C EP 693. Dissertation Seminar 3 cr.
Same as EMD, EDUC, SPED 693.
- C EP 698. Selected Topics 1-6 cr.
Offered under various subtitles which indicate the subject matter covered. A maximum of 6 credits in any one semester and a total of 18 credits overall. Restricted to CEP majors.
- C EP 699. Ed.S. Thesis 1-88 cr.
Study and research at the Specialist in Education level. Each problem to be designated by a qualifying subtitle. Restricted to majors.
- C EP 700. Doctoral Dissertation 0-88 cr.
Dissertation. Restricted to majors.
- C EP 801. Introduction to Psychopharmacology for Psychologists I 3 cr.
This course is an introduction to physiology and an overview of gross and microanatomy, with a focus on gross, micro, and chemical anatomy of the nervous system. By the end of the course, psychologists will have an up-to-date understanding of human psychology, anatomy, and neuroanatomy. Prerequisites: Doctorate in psychology or consent of instructor.
- C EP 802. Introduction to Psychopharmacology for Psychologists II 3 cr.
Principles of organic chemistry and human biochemistry necessary for the understanding of psychopharmacology are discussed and related to the major transmitter systems and dynamics of transmission. By the end of the course, students will have an up-to-date understanding of biochemistry on which to base further didactic study in psychopharmacology. Prerequisites: Doctorate in psychology or consent of instructor.
- C EP 803. Clinical Psychopharmacology I 3 cr.
This course begins with an introduction to the scope of pharmacology; pharmacoepidemiology, ethical, and legal issues (informed consent, State and Federal regulation of drugs and prescribing, sources of drug information and computer aids) and continues with the principles of pharmacokinetics and pharmacodynamics as they relate to the use of psychotropic medications. It concludes with an introduction to the treatment of anxiety disorders from a biopsychosocial model of care with special emphasis on psychopharmacology for anxiety disorders. Prerequisites: Doctorate in psychology or consent of instructor.
- C EP 804. Clinical Psychopharmacology II 3 cr.
This course is a thorough investigation of the diagnosis and treatment of affective disorders from a biopsychosocial model of care. Particular emphasis is given to psychopharmacological treatment of depressive disorders and bipolar disorders. Prerequisites: Doctorate in psychology or consent of instructor.
- C EP 805. Clinical Psychopharmacology III 3 cr.
This course is an intensive study of the treatment of psychosis from a biopsychosocial model of care. Special consideration is given to: first, second, and third generation antipsychotic drugs and their pharmacology and clinical uses; neurological and metabolic disorders associated with antipsychotic use; and appropriate use of antipsychotics in children and the elderly. Special attention is then given to child and adolescent psychopharmacology, including drugs used in pregnancy and lactation, teratogenicity, embryotoxicity, developmental disorders, conduct disorders, ADHD, and special considerations in use of approved drugs in children. Prerequisites: Doctorate in psychology or consent of instructor.
- C EP 806. Pathophysiology for Psychologists I 3 cr.
This course is an introduction to human clinical physical assessment, history taking, charting, and laboratory testing and neuroimaging. An important emphasis is in functional neuroanatomy and diagnosis and assessment of neurological disorders; role of different components of human nervous system in health and disease; stroke, seizures, and movement disorders (chorea, athetosis, dystonias, dyskinesias, Parkinsonism, akathisia, iatrogenic neurological disorders). Prerequisite: Doctorate in psychology or consent of instructor.
- C EP 807. Pathophysiology for Psychologists II 3 cr.
Physical assessment and pathophysiology of the cardiovascular system is studied in depth: structure and function of the heart and major blood vessels; innervation of the heart and vessels; electrocardiogram; components of blood; lymphatics; and physical assessment of cardiac function. The physical assessment and pathophysiology of eyes, ears, nose, and the immune system are studied in depth; anatomy and physiology of special senses; assessment of cranial nerves and sensory function; immune function and psychoimmunology. The physical examination and pathophysiology of the chest and pulmonary system and its relationship to the cardiac system is also studied. Prerequisites: Doctorate in psychology or consent of instructor.
- C EP 808. Pathophysiology for Psychologists III 3 cr.
This course continues with an in-depth study of the chest and pulmonary system: pulmonary function and assessment; respiratory exchange and respiratory involvement in acid: base regulation, disorders of respiratory function. The physical assessment of pathophysiology of the gastrointestinal system is discussed in depth: digestion, absorption and excretion of drugs and nutrients from the GI system; disorders of GI function; hepatic function; innervation of GI tract; endocrine and exocrine functions of GI system; physical assessment of GI function. The functions and pathophysiology of the male and female reproductive system, endocrine system, and renal system are discussed as they relate to psychopharmacology. Prerequisites: Doctorate in psychology or consent of instructor.
- C EP 809. Psychopharmacological Treatment in Special Populations I 3 cr.
The psychopharmacology of several special populations are discussed in detail in this course. Geriatric psychopharmacology includes: geriatric physiology; cardiac, renal, hepatic changes with aging; pharmacokinetics/dynamics in the elderly; cognition enhancers in Alzheimer's and other dementias. Special treatment of personality disorders, eating disorders, the importance of racial, ethnic, and gender differences and culturally sensitive practice is presented with applications. Pain management psychopharmacology is over-viewed, including: pharmacology of opioid and non-opioid analgesics; pain syndromes; acute and chronic pain; headache; pharmacological and non-pharmacological approaches to pain management; pharmacology and actions of abused substances: acute effects, withdrawal, biochemistry of tolerance and dependence, brain central reward pathways. Prerequisites: Doctorate in psychology or consent of instructor.
- C EP 810. Psychopharmacological Treatment in Special Populations II 3 cr.
The pathophysiology and treatment of substance use disorders from a biopsychosocial model is presented. Issues of medical comorbidity are studied: psychopharmacological treatment in the medically compromised patient, including case studies and review of comprehensive treatment models; mental disorders due to a general medical condition and/or adverse drug reactions; and referral practices to specialists. Diagnostic rating scales and psychiatric instruments of use to the prescribing psychologist are presented. The course ends with an integration of psychotherapy and pharmacotherapy, including ethical issues such as the right to refuse treatment, treatment compliance/adherence, risk management, and the role of the medical psychologist in the modern, integrated healthcare system. Prerequisites: Doctorate in psychology or consent of instructor.
- C EP 811. Supervised Experience in Psychopharmacology I 3 cr.
In this applied course, students employ their knowledge of psychopharmacology in treatment setting. Students will participate in the treatment of 50 patients for a minimum of 200 hours under the supervision of a physician. Restricted to Post Doctoral Masters Programs. Prerequisite: Doctorate in psychology or consent of instructor.
- C EP 812. Supervised Experience in Psychopharmacology II 3 cr.
Continuation and completion of supervised experience in CEP 811. Students

will participate in the treatment of 50 patients for a minimum of 200 hours under the supervision of a physician. Restricted to Post Doctoral Masters Program. Prerequisite: Doctorate in psychology or consent of instructor.

CURRICULUM AND INSTRUCTION

Department website: <http://education.nmsu.edu/ci/>
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gmartine@nmsu.edu

E. Cahill, Associate Department Head – Teacher Licensure,, Ph.D., (Kent State)-early childhood education; J. O'Donnell, Department Head, Ed.D. (Massachusetts-Amherst)--critical pedagogy and democratic education and teacher education; H. P. Baptiste, Ed.D. (Indiana)-science elementary; R. C. Chavez, Ed.D. (New Mexico State)- curriculum and multicultural education; H. S. Garcia, Ed.D. (New Mexico State)-bilingual education, critical pedagogy; C. L. Gonzales, Ph.D. (New Mexico)- educational technology, multicultural/bilingual education; K. Glazewski, Ph. D. (Arizona State University) - Learning technologies; problem-based learning; technology-enhanced learning environments; Franzak, J. Ph. D. (New Mexico) Critical approaches to adolescent literacy; secondary language arts education; literacy policy; young adult literature.; O. D. Hadfield, Ed.D. (Northern Arizona)-mathematics, computer education; J. L. Haynes Writer, Ph.D., (New Mexico)-multicultural education, Native American education, teacher preparation, ethnicity, Native American identity, qualitative research; L. Huerta-Charles, Ph.D. (New Mexico State)-early childhood/bilingual education; Kim, Koomi, Ph. D. (University of Arizona), Language, reading and culture, miscue analysis, EMMA (eye movement and miscue analysis), Kinzer, C, Ph. D. (New Mexico State) Mathematics Education; mathematics professional development; learning systems preK-20.; P. Huntsberger, Ph.D. (Michigan State)-adult and continuing education administration; M. Mercado, Ph.D. (New Mexico)-bilingual and early childhood education; M. Morehead, Ed.D. (Missouri-Columbia)-teacher education, classroom management/motivation; H. Oesterreich, Ph.D. (Teachers College Columbia University New York)- Secondary Education; Feminist Critical Curriculum; P. Orelus Ed. D. (University of Massachusetts at Amherst)- Bilingual/ TESOL Education Program; M. Pruyn, Ph.D. (California- Los Angeles)- social/bilingual/ multicultural education; L. V. Reyes, Ph.D. (New Mexico State)-early childhood education and critical pedagogy; M. Ruiz, Ph. D. (New Mexico)- Teaching English to Speakers of Other Languages (TESOL); D. Rutledge, Ph.D. (University of Colorado-Boulder)-learning technologies, international education; M. N. Torres, Ph.D. (New Mexico)- sociocultural and psychological foundation; L. Uribe, Ph. D. (Virginia Tech)- Mathematics Education; K. Wiburg, Ed.D. (U.S. International)-instructional technology;

DEGREE: Master of Arts

MAJOR: Education

CONCENTRATION: Bilingual Education

CONCENTRATION: Early Childhood Education

CONCENTRATION: Early Childhood Special Education

CONCENTRATION: Teaching English to Speakers of Other Languages

DEGREE: Master of Arts in Teaching

CONCENTRATION: Math

CONCENTRATION: Science

CONCENTRATION: Spanish

DEGREE: Specialist in Education

MAJOR: Curriculum and Instruction

CONCENTRATION: Educational Diagnostics

DEGREE: Doctor of Education

MAJOR: Curriculum and Instruction

DEGREE: Doctor of Philosophy

MAJOR: Curriculum and Instruction

MINOR: Bilingual Education

MINOR: Curriculum and Instruction

MINOR: Early Childhood Special Education

MINOR: Education

MINOR: Educational Learning Technologies

MINOR: Reading

The Department of Curriculum and Instruction is devoted to the preparation of master educators for public, private, and governmental institutions. Graduates are prepared to serve as directors of instruction and curriculum, subject matter specialists, supervisors of student teaching and college professors of curriculum and instruction.

Five degree programs are available: Master of Arts (in education), Master of Arts in Teaching, Specialist in Education, Doctor of Education in curriculum and instruction, and Doctor of Philosophy in curriculum and instruction. The Master of Arts requires a concentration in curriculum and instruction. Six areas of concentration are offered: (1) curriculum and instruction, (2) bilingual education, (3) early childhood education, (4) reading, (5) TESOL, and (6) learning technologies. Course work may be taken in elementary education, secondary education, TESOL, curriculum development, instructional techniques, instructional technology, advanced methodology, multicultural education, and teaching fields or endorsement areas.

At the master's degree level, nonthesis option, the department requires a final examination. This written examination is administered once each semester (fall, spring, and summer II). Detailed information about the written exam is available in the department.

The Ph.D. and Ed. D have a theoretical-research orientation. Every doctoral student (Ph.D. and Ed.D.) is required to take a 12-credit research block that includes EDUC 613 and EDUC 576. Furthermore, students enrolled in the Ph.D. program must complete 6 credits in either computer tools courses or the foreign language sequence.

Three years of teaching experience or the equivalent is required for admission to doctoral programs in curriculum and instruction. Applicants for the Ed.S. degree must meet all departmental qualifications and have at least one year of successful teaching experience.

Doctoral-level qualifying exams are held during the spring semester.

Particulars with regard to procedural requirements relating to the degree are available by writing the department head.

Students seeking teacher licensure must meet all Teacher Education Program requirements. Those requirements include an undergraduate GPA of 2.5, passing scores on basic and general portions of the NMTA, and satisfying the requirements for the academic teaching field. Each student must possess the academic ability, character, and attitude suitable for teaching. Students who, in the professional judgment of the faculty and staff, do not possess these qualifications may be examined by a Selective Review Committee. The committee may recommend a variety of actions, ranging from remedial procedures to withdrawal from the Teacher Education Program.

COMPETITIVE ADMISSION PROCESS FOR TEACHER LICENSURE

Applicants who successfully meet the minimum requirements for admission will be reviewed by the Teacher Education Program admission committee. The admission committee will base admission decisions on applicants' academic qualifications, basic skills test scores, written communication, faculty recommendations for the student and the student's portfolio.

Applicants should be aware that admission to the Teacher Education Program is competitive and is based upon available faculty resources. Posted GPA and basic skills test scores are the minimum necessary to be considered for admission to the Teacher Education Program and do not ensure admittance into programs. Applicants are encouraged to develop a strong student portfolio, achieve the highest GPA possible and present a professional portfolio.

GENERAL ADMISSION TO GRADUATE PROGRAMS

The Department of Curriculum and Instruction requires graduate students who have completed 9 credits under the "undeclared" category in the Graduate School and/or nondegree status in the College of Health and Social Services to be admitted into a graduate degree program either in Curriculum and Instruction or any other graduate department in the College of Education. The department will disenroll any student who has not been admitted into a graduate degree program (after completing 9 credits) and additionally, will not allow them to enroll or attend in other Curriculum and Instruction coursework.

BILINGUAL EDUCATION

- BIL 489. Topics** 3 cr.
Course subtitled in the Schedule of Classes. May be repeated three times for a maximum of 9 credits.
- BIL 505. The Bilingual Preschool Child** 3 cr.
Principles of multicultural education applied to preschool and primary levels. Focus on issues, methods, and materials.
- BIL 520. Issues in Schooling for Bilingual Learners** 3 cr.
Identification and consideration of current thought and directions in bilingual education, nationally and internationally.
- BIL 522. Literacy-Language Instruction for Bilingual Students** 3 cr.
Framework and strategies for developing the written language abilities of bilingual learners, with attention to the interrelationships among reading, writing, and oral language.
- BIL 545. Bilingual/Multicultural Schooling and Community Relations** 3 cr.
Rationale, information pertinent to the school and the community in a setting involving economic, cultural, and linguistics diversity.
- BIL 550. Internship in Bilingual Education IV** 1-6 cr.
Advanced experience in educational bilingual settings for prospective bilingual education teachers. Maximum of 6 credits.
- BIL 560. Selected Topics in Bilingual Education III** 1-6 cr.
Various topics on current requests and needs in bilingual education. Maximum of 6 credits. **BIL561. The Bilingual Exceptional Student** 3 cr. Introduction to bilingual/multicultural special education. Same as SPED 561, SPED 661.
- BIL 563. Assessment and Consultation for Exceptional Multicultural Populations** 3 cr.
Covers formal and informal methods of assessment for multicultural populations. Same as SPED 563, SPED 663.
- BIL 570. Directed Study in Bilingual Education III** 1-6 cr.
Independent research topics in bilingual education based on particular individual interest or needs.
- BIL 616. Acquiring Emancipatory Discourses: TESOL/BIL** 3 cr.
An elaboration of understandings of bi- and multilingualism and related models of education based on current research and practice.
- BIL 617. Multiple Critical Literacies** 3 cr.
An exploration of the multiple literacies that operate on the individual, classroom, community, cultural and societal levels.
- BIL 619. Critical Literacies for Adult ESOL Learners** 3 cr.
Bi- and multiliteracy development with a focus on the adult learner; concepts of participatory/critical/popular literacies are foundational to the course.
- BIL 623. Curricular Mediation for Democratic Communities** 3 cr.
Problematization of the various relationships, roles, and leadership considerations which emerge within educational institutions, their structures, and their culturally democratic practices in the classroom, community, and society. Restricted to doctoral-level students of any major. Same as EDUC 623, ECED 623.
- BIL 630. Ethnography of Reading and Writing** 3 cr.
Same as RDG 630.
- BIL 633. Praxis and Reflexivity** 3 cr.
The cyclical research processes of continuous self and systemic (re) evaluation vis-a-vis classroom, community, and society with an eye toward reflection, growth, change, and larger forms of social agency. Prerequisite: consent of instructor. Restricted to doctoral-level students of any major. Same as ECED 633, EDUC 633, RDG 633, EDLT 633.
- BIL 635. Critical Theory and Pedagogy** 3 cr.
Same as EDUC 635.
- BIL 637. Social Justice Issues in Education** 3 cr.
Same as EDUC 637.
- BIL 660. Selected Topics in Bilingual Education IV** 1-9 cr.
Various topics on current requests and needs to bilingual education.
- BIL 663. Assessment and Consultation for Exceptional Multicultural Populations** 3 cr.
Covers formal and informal methods of assessments as well as consultation models for multicultural populations. Same as BIL 563, SPED 563.
- BIL 670. Directed Study in Bilingual Education IV** 1-6 cr.
Independent research topics in bilingual education based on particular individual interest or needs.

EARLY CHILDHOOD EDUCATION

- ECED 451. Play in the Early Childhood Curriculum** 3 cr.
Development of curriculum based on children's play; a means of exploring and learning the patterns of human living, communications, and experiences congruous with their developing interests and capacities.

- ECED 452. Teaching Language Minority Children in Early Childhood Settings** 3 cr.
Framework and strategies for the educational development of young language-minority children.
- ECED 455. Art/Music/PE Curriculum** 3 cr. (2+2P)
Methods and materials for developmentally appropriate practices in teaching art, music, and PE for young children.
- ECED 458. Field Experience Infants Pre-K)** 1 cr.
Supervised field experiences in early childhood settings: infants, toddlers, and pre-K programs. Graded S/U.
- ECED 459. Field Experience K 3)** 1 cr.
Supervised field experiences in early childhood settings: public school programs K 3. Graded S/U.
- ECED 465. Working with Handicapped Infants and Their Families** 3 cr.
Normal and atypical infant development, methods to work effectively with high-risk and handicapped infants/toddlers ages birth to two and their families. Same as SPED 465.
- ECED 470. Student Teaching/Seminar** 6 cr.
Provides student teaching experience in a variety of settings with young children ages birth 8.
- ECED 479. Curriculum in Early Childhood Education** 3 cr.
Development and implementation of curriculum and materials for teaching young children.
- ECED 489. Topics** 3 cr.
Offered under various subtitles which indicate the subject matter to be covered. May be repeated three times for a maximum of 9 credits.
- ECED 505. The Bilingual Preschool Child** 3 cr.
Same as BIL 505.
- ECED 510. Issues in Early Childhood Education** 3 cr.
Examines current trends and problems through readings of theoretical, empirical, and applied literature.
- ECED 515. Working with Parents of Young Children** 3 cr.
Techniques for setting up home and classroom visitations, communicating with parents, and establishing special programs.
- ECED 520. Seminar on Cognitive and Social Development** 3 cr.
In-depth study of developmental theories: Piaget, Kohlberg, Bruner, and Erikson. Implications for development of preschool programs and teaching techniques.
- ECED 540. Science/Math Curriculum** 3 cr. (2+2P)
Methods and materials for developmentally appropriate practices in teaching science and math for young children. Same as ECED 440 with differentiated assignments for graduate students.
- ECED 541. Language Arts/Social Studies** 3 cr. (2+2P)
Methods and materials for developmentally appropriate practices in teaching language arts and social studies for young children. Same as ECED 441 with differentiated assignments for graduate students.
- ECED 560. Introduction to Early Childhood Education** 3 cr.
The teaching and caregiving of young children, age birth-8. Same as ECED 360 with differentiated assignments for graduate students.
- ECED 570. Play in the Early Childhood Curriculum** 3 cr.
Advanced exploration of the development of curriculum based on children's play. A means of exploring and learning the patterns of human living, communications, and experiences congruous with developing interests and capacities. Restricted to majors. Same as ECED 451 with differentiated assignments for graduate students.
- ECED 605. Independent Study Topics in Early Childhood Education** 1-3 cr.
A problem and seminar course for those pursuing an advanced graduate degree. Prerequisite: EDUC 535. May be repeated for a maximum of 6 credits. Restricted to doctoral-level students of any major.
- ECED 606. Inquiry in Early Childhood Education** 3 cr.
A complete research review and examination of practices in early childhood education. Restricted to doctoral-level students of any major.
- ECED 612. History and Philosophy of Early Childhood Education** 3 cr.
Critical analysis of the historical development and philosophical underpinnings of the field of early childhood education as it relates to current practice. Restricted to doctoral-level students of any major.
- ECED 614. Early Childhood, Communities, and Social Policy** 3 cr.
Early childhood politics and policy taken from a global, national, state, and community context. Restricted to doctoral-level students of any major.
- ECED 623. Curricular Mediation for Democratic Communities** 3 cr.
Problematization of the various relationships, roles, and leadership considerations which emerge within educational institutions, their structures, and their culturally democratic practices in the classroom, community, and society. Restricted to doctoral-level students of any major. Same as EDUC 623, BIL 623.

ECED 633. Praxis and Reflexivity	3 cr.
Same as BIL 633, EDUC 633, RDG 633, EDLT 633.	
ECED 636. Teacher Education and Professional Development	3 cr.
Seminar designed to prepare early childhood professionals to teach adults. Restricted to doctoral-level students of any major.	
ECED 698. Selected Topics in Early Childhood Education	1-6 cr.
Offered under various subtitles. May be repeated for a maximum of 6 credits. Restricted to doctoral-level students of any major.	

EDUCATIONAL LEARNING TECHNOLOGIES

EDLT 520. Introduction to Multimedia and Authoring Tools	3 cr.
Explores the educational potential of hypertext, hypermedia, and multimedia. Video, videodisc, CD-ROM, and multimedia authoring tools are used to develop education applications. Prerequisite: EDUC 568 or consent of instructor.	
EDLT 522. Technology and Language Learning	3 cr.
Use of technology to enhance second language and dual language programs. Organized around technology enhanced communicative and interactive language learning environments. Corequisite: EDUC 587 or consent of instructor.	
EDLT 528. Designing Educational Resources for the Internet	3 cr.
Covers how to access, use, design, and evaluate instructional resources on the Internet, use telecommunications to support educational projects, send and receive files and use appropriate tools including compression routines for MS-DOS and Macintosh and client-server programs such as FTP, Gopher, and Archie. Prerequisite: EDUC 568 or consent of instructor. Same as EDLT 628.	
EDLT 529. Developing and Managing Educational Networks	3 cr.
For educators who plan to manage technology resources in schools. Focus on operating systems, network capabilities and management, connections and transfer of files between different computer platforms and managing peripheral devices. Prerequisite: EDUC 568 or consent of instructor.	
EDLT 570. Advanced Instructional Strategies	3 cr.
Applies instructional strategy development supported by technology for classroom curriculum. Prerequisite(s): EDUC 518.	
EDLT 571. Action Research	3 cr.
Identification of action research problems in the field of learning technologies, design of study, data collection and analysis.	
EDLT 573. Technology and Critical Thinking	3 cr.
Use of inquiry and problem-based learning supported by computer-based applications. Critical analysis of multiple forms of electronic media. Prerequisite: EDUC 568 or consent of instructor.	
EDLT 574. Technology Planning and Grant Writing	3 cr.
Application of principles of curriculum development to the integration of technology to improve educational programs. How to develop technology plans, assess current uses of technology, write grants to acquire technology, improve the management of existing and future learning resources, and develop staff development strategies in technology.	
EDLT 577. Theory and Practice for Online Teaching and Learning	3 cr.
Theory and practice of the design, development, and assessment of internet-based curriculum and pedagogy for a diverse society. Prerequisites: EDUC 518 or equivalent and web page development experience.	
EDLT 607. Current Research in Learning and Technology	3 cr.
Explores models and methods for examining and researching the impact of technology on learning and education.	
EDLT 610. Technology, Society, and Education	3 cr.
Same as EDUC 610.	
EDLT 615. Application of Computer Tools for Research	3 cr.
A seminar for doctoral students emphasizing research (data collection and data analysis) tools that use computer applications.	
EDLT 620. Advanced Multimedia Curriculum Development	3 cr.
Explores the use of professional multimedia tools to create learning materials. Prerequisite: EDLT 520.	
EDLT 628. Designing Educational Resources for the Internet	3 cr.
Same as EDLT 528 with additional assignments for doctoral students.	
EDLT 633. Praxis and Reflexivity	3 cr.
Same as BIL 633, ECED 633, EDUC 633, RDG 633.	
EDLT 672. Advanced Curriculum Development	3 cr.
Integration of technology into content areas. Prerequisite(s): EDUC 518.	
EDLT 673. Literacy and Technology	3 cr.
Same as RDG 673, BIL 673.	

CURRICULUM AND INSTRUCTION

EDUC 450. Methods of Teaching Early Childhood Education	3 cr.
Characteristics of the young child, play, guidance, communication, methods, materials, models, issues.	
EDUC 451. Methods of Teaching Elementary School Science	3 cr. (2+2P)
Methods and materials for teaching elementary school science. Includes components of lessons and the use of multimedia. Prerequisites: 9 hours of science from biology, chemistry, physics, and earth sciences, with no more than 3 hours from any one department. Corequisites: ECED 450, EDUC 452, and RDG 360 (Block A courses). Same as EDUC 551 with differentiated assignments for graduate students.	
EDUC 452. Methods of Teaching Elementary School Mathematics	3 cr. (2+2P)
Content, theories of cognition, and instructional approaches for the teaching of mathematics in the elementary grades. Prerequisite: MATH 111. Corequisites: ECED 450, EDUC 451, and RDG 360 (Block A courses). Same as EDUC 552 with differentiated assignments for graduate students.	
EDUC 453. Methods of Teaching Elementary School Language Arts	3 cr. (2+2P)
Implications of language acquisition and development for instructional practices. Focus on student-centered response to literature, writing process, whole language learning, based on socio-psycholinguistic theory and research. Corequisites: RDG 361, EDUC 454, and EDUC 455 (Block B courses). Same as EDUC 553 with differentiated assignments for graduate students.	
EDUC 454. Methods of Teaching Elementary School Social Studies	3 cr. (2+2P)
Focus on social studies curriculum and instruction including student-centered approaches, active learning, educational technology, nontextual curriculum, integration, multicultural education, authentic assessment, and practical applications. Corequisites: RDG 361, EDUC 453, and EDUC 455 (Block B courses). Same as EDUC 554 with differentiated assignments for graduate students.	
EDUC 460. Teaching Language Arts at the Middle and High School Level	3 cr. (2+2P)
Implications of cognition and language development for appropriate secondary instructional practices. Focus on construction of meaning, student-centered response to literature, writing process, print and oral language development, based on socio-psycholinguistic research and theory. Practicum required. Same as EDUC 560.	
EDUC 461. Teaching Social Studies at the Middle and High School Level	3 cr. (2+2P)
Integrating content knowledge and pedagogy for the middle and high school teacher in social studies. The focus will be on a variety of instructional strategies and pedagogical skills that will enhance the learning of social studies. Practicum required. Same as EDUC 561.	
EDUC 462. Teaching Mathematics at the Middle and High School Level	3 cr. (2+2P)
Integrating content knowledge and pedagogy for the middle and high school teacher in mathematics. The focus will be on a variety of instructional strategies and pedagogical skills that will enhance the learning of mathematics. Practicum required. Same as EDUC 562.	
EDUC 463. Teaching Science at the Middle and High School Level	3 cr. (2+2P)
Integrating content knowledge and pedagogy for the middle and high school teacher in science. The focus will be on a variety of instructional strategies and pedagogical skills that will enhance the learning of science for students in grades 6-12. Practicum required. Same as EDUC 563.	
EDUC 464. Teaching Foreign Language at the Middle and High School Level	3 cr. (2+2P)
Integrating content knowledge and pedagogy for the middle and high school teacher in foreign language. The focus will be on a variety of instructional strategies and pedagogical skills that will enhance the learning of foreign language for students in grades 6-12. Practicum required. Same as EDUC 564.	
EDUC 467. Teaching Business Education at the Middle and High School Level	3 cr. (2+2P)
Integrating content knowledge and pedagogy for the middle and high school teacher in business education. The focus will be on a variety of instructional strategies and pedagogical skills that will enhance the learning of business education for students in grades 6-12. Practicum required. Same as EDUC 567.	
EDUC 470. Elementary Student Teaching	9 cr.
Synthesis of knowledge and skills appropriate to teaching in elementary schools. Graded S/U.	
EDUC 471. Secondary Student Teaching	9 cr.
Synthesis of knowledge and skills appropriate to teaching in secondary schools. Graded S/U.	

- EDUC 475. Contemporary Issues in Education** 3 cr. (2+2P)
Discussion of contemporary issues including: classroom management, motivation, conferences, professional organizations, professional ethics, community influences, cultural pluralism, reform movements, instructional influences, and educational technology. Requires field experience component in a school or community setting. Same as EDUC 575.
- EDUC 480. International Student Teaching Seminar** 1 cr.
Preparation for students planning to teach in an international setting. Prerequisite: Must be scheduled one semester before graduation.
- EDUC 481. Elementary Student Teaching Seminar** 3 cr.
Discussion of elementary school issues related to student teaching. Taken concurrently with EDUC 470. Graded S/U.
- EDUC 482. Middle and High School Student Teaching Seminar** 3 cr.
Discussion of secondary school issues related to student teaching. Taken concurrently with EDUC 471. Graded S/U.
- EDUC 483. Second Language Acquisition** 3 cr.
Exploring affective, cultural, linguistic, cognitive factors that influence the second-language-acquisition process with application to classroom practice. Same as EDUC 583.
- EDUC 487. Methods of TESOL** 3 cr.
Effective second language teaching approaches that provide for interactive learning situations, meaningful input language models, varied language use materials, adaptive teacher response strategies, and assessments of student processing needs.
- EDUC 489. Topics** 1-3 cr.
Offered under various subtitles which indicate the subject matter to be covered. A maximum of 3 credits in any one semester and a grand total of 3 credits.
- EDUC 495. Directed Study Courses in Education** 1-3 cr.
Each course shall be identified by a qualifying subtitle. Maximum of 3 credits in any one semester and a grand total of 6 credits.
- EDUC 501. Special Topics** 1-3 cr.
Course subtitled in the Schedule of Classes. A maximum of 3 credits per semester and a total of 6 credits overall.
- EDUC 502. Special Problems** 1-3 cr.
Course subtitled in the Schedule of Classes. A maximum of 3 credits per semester and a total of 6 credits overall.
- EDUC 503. Contemporary Developments** 1-3 cr.
Course subtitled in the Schedule of Classes. A maximum of 3 credits per semester and a total of 6 credits overall.
- EDUC 504. Adult and Family Literacy in TESOL** 3 cr.
An exploration of the theoretical, programmatic, and curricular frameworks for English language learners and their families. Focus on the development of culturally responsive and pedagogically sound literacy programs. Same as RDG 504.
- EDUC 505. Classroom Management** 3 cr.
Strategies for managing classroom settings and determining appropriate modification of instructional approaches to meet changing classroom situations.
- EDUC 506. Adult and Family Literacy** 3 cr.
Principles, practices, and instructional materials for adult and family literacy. Same as RDG 510.
- EDUC 509. Teaching Methods Laboratory** 3 cr.
Practical application of previously learned content. Prerequisites: bachelor's degree and admission to the Graduate School and departmental special program. Elementary or secondary. Graded S/U.
- EDUC 510. Internship/Student Teaching** 6 cr.
Integrated with EDUC 509. Student is assigned to an elementary or secondary classroom for 14-16 weeks. Elementary or secondary. Prerequisite: EDUC 509. Graded S/U.
- EDUC 511. Literary Assessment and Evaluation** 3 cr.
Theoretical and practical aspects of using formal and informal assessment and evaluation procedures in literacy curriculum and instruction. Same as RDG 511.
- EDUC 512. Equity Education for Mathematics Teachers** 3 cr.
This course is designed to increase teacher awareness and ability to address diverse students' learning needs leading to success in mathematics. Prerequisites: Have access to teach in a mathematics classroom with a diverse student population. Same as EDUC 615.
- EDUC 515. Multicultural Education** 3 cr. (2+2P)
Conceptual manifestations of culture, race, and ethnicity, class, gender, exceptionalities, language and bilingualism within the schooling process. Same as EDUC 315 with differentiated assignments for graduate students.
- EDUC 516. Curriculum and Pedagogy I** 3 cr.
Introduction, reconstruction, and other connections among historical, philosophical, sociocultural, psychological, and theoretical foundations of curriculum and pedagogy and their application to culturally and linguistically diverse teaching and learning settings.
- EDUC 518. Technology and Pedagogy** 3 cr.
Critical analysis, design, and evaluation of computer-based technologies in teaching and learning for diverse communities.
- EDUC 519. Research in Curriculum and Pedagogy** 3 cr.
An introduction to qualitative and quantitative designs for research in curriculum and instruction, with emphasis on action research.
- EDUC 520. Action Research Projects** 3 cr.
Deeper explorations and connections among foundations of curriculum and pedagogy and their application to culturally and linguistically diverse teaching and learning settings through action research projects, approaches to assessment, and agency. Prerequisite(s): EDUC 515, 516, 518 & 519.
- EDUC 530. Exploration in Education** 3 cr. (2+2P)
Overview of elementary and secondary schooling. Includes opportunities to gain teaching experience in diverse settings.
- EDUC 536. Special Studies: Bilingual Education, Curriculum and Instruction, Early Childhood Education, or Read** 3 cr.
Each study will be designated by a qualifying subtitle.
- EDUC 537. Independent Readings** 1-3 cr.
Each project will be designated by a qualifying subtitle.
- EDUC 550. Methods of Teaching Early Childhood Education** 3 cr.
Characteristics of the young child, play, guidance, communication, methods, materials, models, issues. Same as EDUC 450 with differentiated assignments for graduate students.
- EDUC 551. Methods of Teaching Elementary School Science** 3 cr. (2+2P)
Methods and materials for teaching elementary school science. Includes components of lessons, planning and teaching lessons in schools, and multimedia. Prerequisites: 9 hours of science from biology, chemistry, physics, and earth science with no more than 3 hours from any one department. Corequisites: ECED 550, EDUC 552, and RDG 560 (block A course). Same as EDUC 451 with differentiated assignments for graduate students.
- EDUC 552. Methods of Teaching Elementary School Mathematics** 3 cr. (2+2P)
Content, theories of cognition, and instructional approaches for the teaching of mathematics in the elementary grades. Prerequisite: MATH 111. Corequisites: ECED 550, EDUC 551, and RDG 560 (block A course). Same as EDUC 452 with differentiated assignments for graduate students.
- EDUC 553. Methods of Teaching Elementary School Language Arts** 3 cr. (2+2P)
Implications of language acquisition and development for instructional practices. Focus on student-centered response to literature, writing process, whole language learning, based on socio-psycholinguistic theory and research. Corequisites: EDUC 554, EDUC 555, and RDG 561 (block B course). Same as EDUC 453 with differentiated assignments for graduate students.
- EDUC 554. Methods of Teaching Elementary School Social Studies** 3 cr. (2+2P)
Focus on social studies curriculum and instruction including student-centered approaches, active learning, educational technology, nontextual curriculum, integration, multicultural education, authentic assessment, and practical applications. Corequisites: EDUC 553, EDUC 555, and RDG 561 (block B course). Same as EDUC 454 with differentiated assignments for graduate students.
- EDUC 557. Science and Math Methods: Internship** 3 cr.
Elementary alternative licensure process course designed to introduce intern licensed teachers to methods of instruction for mathematics and science. University supervision provided simultaneously with EDUC 557. Restricted to CI and HSS non-degree students.
- EDUC 558. Social Studies/Language Arts Methods Internship** 3 cr.
Elementary alternative licensure process course designed to introduce intern licensed teachers to methods of instruction of social studies and language arts. University supervision provided simultaneously with EDUC 558. Restricted to CI and HSS non-degree students.
- EDUC 560. Teaching Language Arts at the Middle and High School Level** 3 cr. (2+2P)
Implications of cognition and language development for appropriate secondary instructional practices. Focus on construction of meaning, student-centered response to literature, writing process, print and oral language development, based on socio-psycholinguistic research and theory. Practicum required. Same as EDUC 460 with differentiated assignments for graduate students.
- EDUC 561. Teaching Social Studies at the Middle and High School Level** 3 cr. (2+2P)
Integrating content knowledge and pedagogy for the middle and high school teacher in social studies. The focus will be on a variety of instructional

- tional strategies and pedagogical skills that will enhance the learning of social studies for student in grades 6-12. Practicum required. Same as EDUC 461 with differentiated assignments for graduate students.
- EDUC 562. Teaching Mathematics at the Middle and High School Level 3 cr. (2+2P)
Integrating content knowledge and pedagogy for the middle and high school teacher in mathematics. The focus will be on a variety of instructional strategies and pedagogical skills that will enhance the learning of students in 6-12 setting settings for mathematics. Same as 462 with differentiated assignments for graduate students.
- EDUC 563. Teaching Science at the Middle and High School Level 3 cr. (2+2P)
Integrating content knowledge and pedagogy for the middle and high school teacher in science. The focus will be on a variety of instructional strategies and pedagogical skills that will enhance the learning of science for student in grades 6-12. Practicum required. Same as EDUC 463 with differentiated assignments for graduate students.
- EDUC 564. Teaching Foreign Language and the Middle and High School Level 3 cr. (2+2P)
Integrating content knowledge and pedagogy for the middle and high school teacher in foreign language. The focus will be on a variety of instructional strategies and pedagogical skills that will enhance the learning of foreign language for student in grades 6-12. Practicum required. Same as EDUC 464 with differentiated assignments for graduate students.
- EDUC 567. Teaching Business Education at the Middle and High School Level 3 cr. (2+2P)
Integrating content knowledge and pedagogy for the middle and high school teacher in business education. The focus will be on a variety of instructional strategies and pedagogical skills that will enhance the learning of business education for student in grades 6-12. Practicum required. Same as EDUC 467 with differentiated assignments for graduate students.
- EDUC 570. Classroom Research I 3 cr.
Introduction to action research techniques for classroom teachers. For interns only.
- EDUC 575. Contemporary Issues in Education 3 cr. (2+2P)
Discussion of contemporary issues including: classroom management, motivation, conferences, professional organizations, professional ethics, community influences, cultural pluralism, reform movements, instructional influences, and educational technology. The class will require a field experience component in a school or community setting. Taught with EDUC 475 with differentiated assignments for graduate students.
- EDUC 576. Qualitative Research 3 cr.
Introduction to qualitative research methodologies from problem formulation to interpretation of results.
- EDUC 583. Second Language Acquisition 3 cr.
Exploring affective, cultural, linguistic, cognitive factors that influence the second-language-acquisition process with application to classroom practice. Appropriate for public school and adult educators. Same as EDUC 483.
- EDUC 587. Pedagogy of TESOL 3 cr.
Overview of approaches that provide for interactive, culturally responsive pedagogy for students acquiring English. Emphasis on development of ESL literacy. Appropriate for public school and adult educators. Same as RDG 587.
- EDUC 590. TESOL Practicum 3 cr.
Classroom applications of ESL literacy development through supervised teaching experiences accompanied by a seminar. Same as RDG 590.
- EDUC 595. Directed Study Courses in Education 1-3 cr.
Each course will be identified by a qualifying subtitle. Maximum of 3 credits in any one semester and a total of 6 credits overall.
- EDUC 598. Special Research Programs 1-3 cr.
Individual investigations either analytical or experimental. Maximum of 3 credits per semester and a total of 6 credits overall.
- EDUC 599. Master's Thesis 0-88 cr.
Thesis.
- EDUC 600. Doctoral Research 1-88 cr.
Research.
- EDUC 601. Contemporary Curriculum/Instruction Practices 1-3 cr.
Course subtitled in the Schedule of Classes. A maximum of 3 credits per semester and a total of 6 credits overall.
- EDUC 602. Internship in Curriculum and Instruction 3-6 cr.
For those pursuing an advanced graduate degree to meet the requirement for field work. Each course to bear an appropriate subtitle.
- EDUC 603. Curriculum for a Diverse Society 3 cr.
Builds upon knowledge of the foundations of curriculum and professional experience in an educational setting. Focus on the role of the curriculum leader in understanding curriculum theory, designing curriculum, and implementing curriculum in various settings.
- EDUC 604. Pedagogy of Learning in a Diverse Society 3 cr.
Builds upon knowledge of the foundations of instruction and professional experience in teaching and learning. Focus on diverse theories of instruction with relevant practices in pluralistic settings and multicultural interactions of teaching and learning.
- EDUC 605. Independent Study Topics 1-3 cr.
A problem and seminar course for those pursuing an advanced graduate degree. Course subtitled in the Schedule of Classes. Prerequisite: EDUC 535.
- EDUC 606. In-depth Interviewing: A Qualitative Research Method 3 cr.
Use of pilot research project to introduce students to in-depth interviewing techniques.
- EDUC 607. Current Research in Educational Practice 3 cr.
A seminar for doctoral and education specialist students emphasizing current research and educational practices. Same as BIL 607, ECED 607, RDG 607, and SPED 607.
- EDUC 608. Issues in Multicultural Curriculum and Instruction and Teacher Education 3 cr.
Builds upon multicultural theories and practices of teacher education. Restricted to doctoral-level students of any major.
- EDUC 610. Technology, Society, and Education 3 cr.
Investigates models of the change process, examines speculations related to the directions and dynamics of change in an era of electronic technologies, explores shifts in the cultural and personal activities and relations of humans, and speculates on concomitant educational implications. Same as EDLT 610.
- EDUC 613. Evaluation of Quantitative Research in Education 3 cr.
A doctoral-level exploration of a broad range of quantitative research designs and methodologies for collection and analysis of data as applied to critical review of the literature. Prerequisite: EDUC 513 or the equivalent.
- EDUC 614. Schooling for a Democratic Society 3 cr.
Examines the foundations of the U.S. public school with special attention to the struggle for equity and access in education. Restricted to doctoral-level students of any major.
- EDUC 623. Curricular Mediation for Democratic Communities 3 cr.
Problematicization of the various relationships, roles, and leadership considerations which emerge within educational institutions, their structures, and their culturally democratic practices in the classroom, community, and society. Restricted to doctoral-level students of any major. Same as BIL 623, ECED 623.
- EDUC 632. Multicultural Education Curricular and Pedagogical Trends 3 cr.
Study and critique of historical constructs, philosophical considerations, paradigm orientations, theories, and pedagogical practices foundational to multi-perspective understanding of multicultural education. Restricted to doctoral-level students of any major.
- EDUC 633. Praxis and Reflexivity 3 cr.
Same as BIL 633, ECED 633, EDLT 633, RDG 633.
- EDUC 634. Research as Praxis 3 cr.
Alternative community-or-school-based research aimed at investigating and transforming educational realities, with the participants for their own benefit. Students will experience the dynamic between research theory and practice in education. Prerequisites: EDUC 576 and 613. Restricted to majors.
- EDUC 635. Critical Theory and Pedagogy 3 cr.
Covers the various schools of thought on pedagogy, the historical and philosophical foundations embedded in these schools, and their impact on educational settings. Restricted to doctoral-level students of any major. Same as BIL 635.
- EDUC 637. Social Justice Issues in Education 3 cr.
Covers the systems of oppression located within the constructs of power and hegemony and their impact on schooling. Restricted to doctoral-level students of any major. Same as BIL 637.
- EDUC 685. Practicum 2-6 cr.
Provision for field inquiries and experiences designed to prepare the doctoral student for assuming responsibilities in the areas of curriculum and instruction. Prerequisite: post-master's standing.
- EDUC 694. Dissertation Seminar: Qualitative Research Designs 1-6 cr.
Dissertation seminar course for doctoral students utilizing a qualitative research design. Prerequisite: consent of instructor. Restricted to College of Education students.
- EDUC 698. Selected Topics 1-6 cr.
Offered under various subtitles which indicate the subject matter to be covered. A maximum of 6 credits per semester and a total of 6 credits overall.
- EDUC 699. Ed.S. Thesis 1-88 cr.
Offered primarily for those pursuing the research requirements for the Ed.S. degree. Course may be repeated up to a maximum allowed for this degree. Each research project will be designated by a qualifying subtitle.
- EDUC 700. Doctoral Dissertation 0-88 cr.
Dissertation.

READING

- RDG 510. Adult and Family Literacy 3 cr.
Principles, practices, and instructional materials for adult and family literacy. Same as EDUC 506.
- RDG 511. Literacy Assessment and Evaluation 3 cr.
Theoretical and practical aspects of using formal and informal assessment and evaluation procedures in literacy curriculum and instruction. Same as EDUC 511.
- RDG 514. Content Area Literacy 3 cr.
Surveys integrated reading/writing/discursive practices in middle/secondary content areas. Same as RDG 314.
- RDG 522. Language and Literacy Acquisition 3 cr.
Framework and strategies of language and literacy acquisition with attention to bilingual learners and the interrelationship among reading, writing, and oral language. Same as BIL 522, RDG 422.
- RDG 525. Pedagogy and Theory of Literature for Adolescents 3 cr.
This course provides an in-depth exploration of pedagogy and theory related to literature for adolescents Prerequisite(s): Graduate Standing.
- RDG 530. Sociopsycholinguistics of Reading 3 cr.
Examines current research on reading process, learning to read, and teaching children to read and evaluates current programs and materials.
- RDG 536. Special Studies in Literacy 1-6 cr.
Each study will be designated by a qualifying subtitle. Same as RDG 636.
- RDG 537. Independent Study in Literacy 1-6 cr.
Each project will be designated by a qualifying subtitle. Same as RDG 637.
- RDG 551. Literacy Development in Early Childhood 3 cr.
Advanced theory, research, and practice relating to early childhood reading. Same as RDG 351.
- RDG 555. Introduction to Instructional Leadership for Literacy Educators 3 cr.
Three credit course will introduce students to the roles and responsibilities of literacy specialists in the k-12 school setting. Prerequisite(s): Graduate standing, RDG 511 & RDG 530.
- RDG 560. Elementary School Literacy I 3 cr. (2+2P)
Reading development, curriculum, and instruction in the elementary grades. Corequisites: ECED 550, EDUC 551, and EDUC 552 (block A course). Same as RDG 360 with differentiated assignments for graduate students.
- RDG 561. Elementary School Literacy II 3 cr. (2+2P)
Reading development in curriculum and instruction with assessment and evaluation in the elementary grades (K-8). Prerequisite: RDG 560. Corequisites: EDUC 553, EDUC 554, and EDUC 555 (block B course). Same as RDG 361 with differentiated assignments for graduate students.
- RDG 585. Practicum in Literacy Education 1-6 cr.
Supervised laboratory experience with children with reading difficulties. The student implements a program of specific procedures to aid the disabled reader. Prerequisite: RDG 511.
- RDG 587. Pedagogy of TESOL 3 cr.
Overview of approaches that provide for interactive, culturally responsive pedagogy for students acquiring English. Emphasis on development of ESL literacy. Appropriate for public school and adult educators. Same as EDUC 587.
- RDG 598. Selected Topics in Literacy 1-6 cr.
Offered under different subtitles in the Schedule of Classes. Same as RDG 698 with differentiated subjects for doctoral students.
- RDG 600. Doctoral Research in Literacy 1-88 cr.
Research on topic of interest.
- RDG 605. Independent Study Topics in Reading 1-6 cr.
A problem and seminar course for those pursuing an advanced degree. Each course will have an appropriate subtitle.
- RDG 608. Critical Issues in Literacy Education 3 cr.
Critical issues from historical to current perspectives.
- RDG 616. Acquiring Emancipatory Discourses and TESOL/BIL 3 cr.
Same as BIL 616.
- RDG 617. Multiple Critical Literacies 3 cr.
Same as BIL 617.
- RDG 621. Literacy/Biliteracy Assessment and Evaluation 3 cr.
Same as BIL 621.
- RDG 630. Ethnography of Reading and Writing 3 cr.
Covers the dynamics of data interpretation and critical analysis in the study of literacy.
- RDG 633. Praxis and Reflexivity 3 cr.
Same as BIL 633, ECED 633, EDLT 633, EDUC 633.
- RDG 636. Special Studies in Literacy 1-6 cr.
Offered under different subtitles in the Schedule of Classes. Same as RDG 536 with differentiated assignments for doctoral students.
- RDG 639. Multiculturalism, Literature, and Inquiry 3 cr.
Advanced exploration and examination of critical multicultural language education vis-a-vis children's adolescent, young adult, and adult literature, with an eye toward problematizing assumptions about literacy, articulating issues of social justice and enacting transactive, transformative pedagogy. Same as BIL 639.
- RDG 640. Higher Education Teaching Apprenticeship 1-6 cr.
Instructor apprenticeship in teaching university-level literacy-related classes. Each course should bear a qualifying subtitle. Maximum of 6 credits per semester and a maximum of 6 credits.
- RDG 685. Advanced Internship K-12 Literacy 3 cr.
Advanced internship in a professional position/research/application within K-12 schools and classes. Restricted to doctoral-level students of any major. Same as BIL 685.
- RDG 698. Selected Topics in Literacy 1-6 cr.
Offered under various subtitles that indicate the subject matter. Same as RDG 598.
- RDG 699. Research Project 1-88 cr.
Offered primarily for those pursuing the research requirement for the Ed.S. degree. Each research project will be designated by a qualifying subtitle.

EDUCATIONAL MANAGEMENT AND DEVELOPMENT

Department website: <http://education.nmsu.edu/emd/>
(575) 646-3825
edmandev@nmsu.edu

D. Christman, department head Ed.D. (Oklahoma State)- educational administration, higher education, educational change processes, gender and American Indian issues, multicultural leadership; E. C. Arellano, Ph.D. (New Mexico State)- community college administration, legal aspects in education, U.S. Mexico higher education collaboration; R. Domínguez, Ph.D. (New Mexico State)-educational administration, higher education, community college administration, leadership development; J.M. Hannan, Ph.D. (New Mexico State University)-distance education administration, best practices in teaching distance education, student services for distance education students; A. Humada-Ludeke, Ed.D. (Arizona State)- school administration, organizational change, educational accountability, leadership development, Pk-20 collaborations and partnerships; G.M. Ivory, Ed.D. (Texas Tech)- research design and evaluation, management technology, K. Kew, Ph.D. (Boston College)- educational change and reform, educational leadership, school culture, micro-politics; A.F. Osanloo, Ph.D. (Arizona State)- educational equality, educational leadership and policy, philosophical foundation of education, issues of race, class, gender, and civic in education; M. Prentice, Ph.D. (University of Texas at -Austin)- community college administration, service learning retirement issues, gender issues in education, best practices in teaching higher education; C. Rodriguez, Ph.D. (University of Texas at Austin)- education policy and leadership, Pk-20 access policy, Latino and borderland studies; C. T. Townley, Ph.D. (University of Michigan)-knowledge management, higher education. Emeritus
A. L. Armendáriz, Ph.D. (University of New Mexico)-school administration, leadership development, organizational theory; M.L. González, Ph.D. (New Mexico State)-leadership in public school administration, multicultural organizations.

DEGREE: Master of Arts**MAJOR: Educational Administration****DEGREE: Specialist in Education****MAJOR: Educational Administration****DEGREE: Doctor of Education****MAJOR: Educational Administration****DEGREE: Doctor of Philosophy****MAJOR: Educational Administration****MINOR: Educational Administration**

The mission of the Department of Educational Management and Development at New Mexico State University is to prepare and graduate capable, skillful

and dynamic educational leaders for a diverse society. Through the use of theory and practice we aim to develop change agents and role models for socially-just educational systems.

Students studying in these programs are generally interested in the following categories:

- Those seeking preparation for careers as educational leaders and administrators in Pk-12 school sectors. Positions most commonly sought are principals, superintendents, supervisors, program directors, central office staff, and state education agency leaders.
- Those seeking preparation for administrative and leadership careers in postsecondary education at the community college and university level, as well as in technical-vocational education. This particular focus can include preparation for the professoriate.
- Those seeking preparation for careers in educational research, agency and program evaluation, and educational management technology. Positions cover placement in a broad range of employment situations within school districts, community colleges, universities, government, and industry.

GENERAL ADMISSION

The Department of Educational Management and Development requires students who have completed 9 credits under the "undeclared" category in the Graduate School and/or nondegree status at the Registrar's office to be admitted into a graduate degree program either in EMD or any other College of Education graduate department. The department will disenroll any student who has not been admitted into a graduate degree program (after completing 9 credits) and, additionally, will not allow them to enroll in other EMD course work.

ADMISSION TO EMD CLASSES

Admission to EMD coursework is generally done by cohort. Registration in any EMD 500-level course requires

1. full admission to the EMD department, or
2. admission to another COE graduate degree department, and
3. consent of the EMD Programs Coordinator and/or EMD Department Head.

MASTER OF ARTS

The Master of Arts (M.A.) in educational administration focuses on two areas: Pk-12 school administration and Postsecondary education. The program of study for Pk-12 school administration includes all course-work and internships required by the New Mexico State Public Education Department for Administrative Licensure.

Admission

Grade point average requirements for the master's program are consistent with those of the Graduate School. However, in addition to these requirements, all master's degree applicants must provide a letter of application indicating career interests and reasons for wanting to pursue a master's degree in the department; a professional résumé; a two page professional or academic writing sample; official document showing three years of Pk-12 teaching experience (for those pursuing the Pk-12 administration focus); and three letters of recommendation. The EMD admissions committee bases admissions decisions on this portfolio and will not consider incomplete applications.

DOCTORATE DEGREES

The Department of Educational Management and Development offers both the Doctor of Education (Ed.D.) and the Doctor of Philosophy (Ph.D.). The Doctor of Education is geared toward those students wishing to pursue a degree which will help them in their profession. Course work, internships, and research are constructed to develop individuals for administrative positions in Pk-12 schools and in postsecondary institutions.

The Doctor of Philosophy is a research-oriented degree. Course work and internships will be directed toward developing research proficiencies in educational leadership. The Ph.D. also requires additional hours of coursework in an approved cognate area.

Admission

The department requires applicants to complete a Doctoral Admissions Portfolio. Specific details and criteria are available from the Department of Educational Management and Development.

ADMINISTRATIVE LICENSURE

Details regarding licensure in educational administration are available from the department head or internship coordinator. State licensure requirements are available from <http://www.ped.state.nm.us/Licensure/index.html>

GRADUATE ASSISTANTSHIPS

Some graduate assistantships are available in the department. Interested persons should inquire at an early date. (Due date for application for the following academic year is March 15.) Detailed information on programs may be obtained by writing the department. For additional information on degree requirements, consult the Graduate School and College of Education policies listed in the "General Information" chapter of this catalog. Specific criteria for each program are available from the Department of Educational Management and Development.

EDUCATIONAL MANAGEMENT AND DEVELOPMENT

EMD 502. Special Problems.	1-3 cr.
Offered under various subtitles which indicate the subject matter covered. May be taken for a maximum of 3 credits per semester and a total of 6 credits overall.	
EMD 511. Foundation for School Library Specialists	3 cr.
Elements of librarianship. Introduction to the history, purpose, and role of the school library. Overview of current issues and legislation affecting school libraries. Same as EMD 411.	
EMD 512. Administration of the School Library	3 cr.
Principles and practices related to the function, structure, and management of school libraries. Same as EMD 412.	
EMD 513. Curriculum Role of the School Library Specialist	3 cr.
Introduction to the integration of curriculum in school library programs. Current trends in collaborative planning, and teaching between school librarians and teachers. Same as EMD 413.	
EMD 514. Collection Management and Development in School Libraries	3 cr.
Principles of identifying, selecting, acquiring, managing and evaluating information for school libraries. Same as EMD 414.	
EMD 530. Management of Educational Change	3 cr.
Leadership in implementing innovations in education.	
EMD 531. Special Education Administration	3 cr.
Competencies for the administration of special education programs with an emphasis upon New Mexico public school standards.	
EMD 532. Human Relations in Educational Administration	3 cr.
Administrative skills necessary to promote quality relationships among staff, students, and parents; also skills needed to open communication and work with various individuals and groups in educational settings.	
EMD 540. Management of Student Services in Higher Education	3 cr.
History and overview of student services (e.g., admissions, counseling, registration, financial aid, housing, food services, student organizations) and a review of management components used in student services.	
EMD 550. Higher Education Law	3 cr.
This course is designed to review the impact of the legal process and the judiciary on higher education.	
EMD 555. Higher Education Finance and Funding	3 cr.
This course examines the impact and process of financing and funding higher education.	
EMD 563. Higher Education Administration	3 cr.
This course provides an overview of higher education in the United States including history, mission, and governance, in the context of organizational theory.	
EMD 564. Internship Public Schools Part I	3 cr.
First half of a practical internship in PK-12 schools under supervision of school administrator. Prerequisites: 18 cr. of EMD coursework, 3 years of PK-12 teaching experience and consent of instructor. Restricted to majors.	
EMD 565. Internship: Public Schools Part II	3 cr.
Second half of a practical internship in administrative setting under supervision of experienced higher education administrator. Prerequisites: EMD 566 and consent of instructor. Restricted to majors.	
EMD 566. Internship: Higher Education Part I	3 cr.
First half of practical internship in administrative setting under supervision of experienced higher education administrator. Prerequisites: 15 credits of EMD and consent of instructor. Restricted to majors.	
EMD 567. Internship: Higher Education Part II	3 cr.
A practical internship in administrative setting under supervision of experienced administrators. Prerequisites: 15 credits of EMD and/or consent of instructor.	

EMD 568. Topics in School Administration Designated by subtitle.	1-3 cr.	in the field of educational leadership. Prerequisite: consent of instructor. Restricted to majors.
EMD 569. Basing Decision on Data: Higher Education. Analysis of accountability data and other evidence to support educational decision making. Disaggregating and interpreting assessment data to guide improvement of instruction. Moving from evidence to plans for action.	3 cr.	EMD 630. Concepts of Leadership in Education Survey of concepts of leadership in general and educational leadership in particular. Consideration of implications for practice. Restricted to majors.
EMD 570. Educational Leadership, Supervision, and Evaluation Leadership, supervision, and evaluation in PK-12 and post secondary education.	3 cr.	EMD 640. Management of Student Services in Higher Education History and overview of student services (e.g., admissions, counseling, registration, financial aid, housing, food services, student organizations) and a review of management components used in student services. Restricted to Doctoral EMD majors.
EMD 572. History and Philosophy of Education An overview of the historical development of the American school system and the relation of various philosophies to American education.	3 cr.	EMD 650. Higher Education Law This advanced course is designed to review the impact of the judiciary on higher education. The legal standing of institutions of higher education on issues of staff rights, student rights, and tort liability will be addressed. In addition, the impact of local ordinances, state and federal laws and regulations will be examined. This course is restricted to doctoral students.
EMD 575. The Principalship Key issues surrounding the role of school-site leaders.	3 cr.	EMD 655. Higher Education Finance and Funding This advanced course examines the impact and process of financing and funding higher education. The course is an examination of higher education finance as it relates to operational budgets, capital budgets, and policy issues which impact the financing of higher education. This course is restricted to doctoral students.
EMD 576. Educational Financial Management Educational finance and business applications.	3 cr.	EMD 665. Higher Education Administration This is an advanced course that provides an overview of higher education in the United States including history, mission, and governance, in the context of organizational theory. This course is restricted to doctoral students.
EMD 578. Leadership and Administration of Bilingual Education Concepts and practical approaches to improving the education of English languages learners through higher education. Restricted to majors.	3 cr.	EMD 670. Advanced Internship For those pursuing an advanced degree to meet the field work requirement. To bear an appropriate subtitle. Graded S/U.
EMD 579. Public School Law Legal processes of education, major court decisions and the legislative process will be studied.	3 cr.	EMD 671. Foundations of Educational Administration Advanced course about the political, economic, and social forces on policy making and governance of Pk-12 and postsecondary education. Restricted to Doctoral EMD majors.
EMD 580. Administration of Adult and Continuing Education Administration of programs in public schools, higher education, community and nontraditional educational settings.	3 cr.	EMD 676. Educational Financial Management This advanced course offers an overview of economic and financial concerns relating to the public school system of the United States. This course is restricted to doctoral students.
EMD 581. Design, Development, and Administration of Distance Education Programs Quality distance education programs require skills in new policy development, program administration, and faculty training to reconfigure existing courses for delivery via voice, video, and data.	3 cr.	EMD 679. Public School Law Advanced course in which the legal processes of education, major court decisions, and the legislative process will be studied. This course is restricted to doctoral students.
EMD 582. Community College Administration An overview of the history, role, objectives and patterns governing the effectiveness of the community college.	3 cr.	EMD 682. Quantitative Research II Advanced quantitative methods of research and implementation in the field of educational leadership. Prerequisite: EMD 622 and consent of instructor. Restricted to majors.
EMD 585. Elements of Research Survey and analysis of research methods and designs focusing on sound educational research and its presentation.	3 cr.	EMD 683. Qualitative Research II Advanced qualitative methods of research and implementation in the field of educational leadership. Prerequisite: EMD 623 and consent of instructor. Restricted to majors.
EMD 586. Multicultural Leadership in Education Examine cultural diversity and how appropriate understanding, leadership and instructional strategies can be used to reach all learners. Enhances understanding of what it means to be an educator in culturally diverse contexts. Restricted to majors.	3 cr.	EMD 685. Elements of Research Advanced survey and analysis of research methods and designs focusing on sound educational research and its presentation. This course is restricted to doctoral students.
EMD 587. Educational Politics and Community Relations Politics, policies, and community relations impacting PK-12 and postsecondary education.	3 cr.	EMD 689. Evaluation Design in Education Advanced course that focuses on evaluation and accountability models; application to educational programs. This course is restricted to doctoral students.
EMD 589. Evaluation Design in Education This course focuses on evaluation and accountability models; application to educational programs.	3 cr.	EMD 693. Dissertation Seminar Same as BIL, C EP, ECED, EDUC, RDG, SPED 693.
EMD 590. Basing Decision on Data: PK-12 Analysis of accountability data and other evidence to support educational decision making. Disaggregating and interpreting assessment data to guide improvement of instruction. Moving from evidence to plans for action. Prerequisite: EMD 569.	3 cr.	EMD 698. Selected Topics Offered under various subtitles which indicate the subject matter covered. May be taken for a maximum of 6 credits per semester and a total of 6 credits overall.
EMD 595. Current Topics Offered under various subtitles which indicate the subject matter covered. May be taken for a maximum of 6 credits.	1-6 cr.	EMD 699. Ed.S. Research Project In completing the Ed.S. degree, student has the option of conducting a research project or writing a thesis.
EMD 598. Independent Studies Individual investigation in special topic areas. Requires prior approval of project advisor.	1-3 cr.	EMD 700. Doctoral Dissertation Dissertation. Consent of instructor required. Minimum of 3 credits per semester. May be taken for a maximum of 36 credits.
EMD 599. Master's Thesis Thesis.	0-88 cr.	
EMD 600. Doctoral Research Research. S/U to traditional grade options.	1-88 cr.	
EMD 620. Doctoral Seminar A study of current issues in educational administration at the national, state, and local levels.	1-3 cr.	
EMD 621. Doctoral Seminar II A survey of research methodologies in educational administration. Prerequisite: consent of instructor. Restricted to majors.	3 cr.	
EMD 622. Quantitative Research I Explores quantitative research methods and models, and their application in the field of educational leadership. Prerequisite: consent of instructor. Restricted to majors.	3 cr.	
EMD 623. Qualitative Research I Explores qualitative research methods and models, and their application	3 cr.	

SPECIAL EDUCATION/ COMMUNICATION DISORDERS

Department website: <http://education.nmsu.edu/sped/>
(575) 646-2402
sanromer@nmsu.edu

R. Rhodes, Ph.D., department head, (Northern Colorado)-school psychology; Y. Bae, Ph.D. (Illinois- Urbana)- speech and hearing science; M. Brown, Ph.D. (UNLV) special education and secondary special education; K. Chinn, Ed.D. (Lamar)- deaf education/deaf studies; K. Cronin, Ph.D. (UC Riverside)-special education; J. Duseau, M.S. (Northern Illinois) orientation and mobility; A. Y. Gallegos, Ed.D. (New Mexico State)-special education, curriculum and instruction; R. Ivey, Ph.D. (Wisconsin)-audiology; E. Lopez, Ph.D. (Iowa)- school psychology and bilingual special education; C. Mason, M.S. (Texas – El Paso) – communication disorders; A.Y. Ortega, Ph.D. (Illinois- Urbana)- speech and hearing science; E. Poel, Ph.D. (New Mexico State) special education; D. Rhein, Ph.D. (Arizona) communication disorders; L. Salas, Ph.D. (New Mexico State)-bilingual special education; M.B. Salas-provance, Ph.D. (Illinois-Urbana)- speech and hearing science; A. Valdez, Ph.D. (University of New Mexico)-educational psychology; J. Wood, Ed.D. (Oklahoma State) visual impairments

DEGREE: Master of Arts
MAJOR: Communication Disorders

DEGREE: Master of Arts
MAJOR: Education

CONCENTRATION: Autism Spectrum Disorders
CONCENTRATION: Special Education
CONCENTRATION: Special Education Administration
CONCENTRATION: Special Education/Deaf-Hard of Hearing
CONCENTRATION: Speech-Language Pathology

DEGREE: Specialist in Education
MAJOR: Curriculum and Instruction
CONCENTRATION: Special Education Administration
CONCENTRATION: Special Education/ Deaf-Hard of Hearing
CONCENTRATION: Special Education

DEGREE: Doctor of Education
MAJOR: Special Education
CONCENTRATION: Bilingual/Multicultural Special Education

DEGREE: Doctor of Philosophy
MAJOR: Special Education
CONCENTRATION: Bilingual/Multicultural Special Education

MINOR: Communication Disorders
MINOR: Deaf Education
MINOR: Special Education

The Department of Special Education/Communication Disorders offers programs designed for students with career goals as master special education teachers, special education consultants and directors, educational diagnosticians, school psychologists, and speech-language pathologists in school, community, and medical settings, or as higher education faculty in the fields of special education (SPED) and communication disorders (CD).

The department offers programs leading to the Master's degree. The M.A. in education with emphasis in special education can be earned with the following emphasis: general special education (i.e., noncategorical), mild-to-moderate disabilities (behavior disorders, learning disabilities, and mental retardation), early-childhood special education, bilingual special education, special education administration, deaf/hard-of-hearing education, and educational diagnostics. Students who have earned a bachelor's degree and who are seeking special education licensure must enroll in a graduate degree program. Depending on the individual student's needs and experiences, programs can be designed to lead toward special education licensure, specialization in categorical areas, educational diagnostician licensure, or administrative licensure.

The M.A. in Communication Disorders offers a specialization in speech-language pathology. The program is designed primarily for students who are interested in becoming speech-language pathologists in schools, hospitals, community-based clinical facilities, or private practice. The programs for students entering without a communication disorders background are generally one year longer. The programs are designed to provide the academic background and clinical-practicum experience for meeting state and national certification and licensure requirements.

The master's degree program in speech-language pathology is accredited by the Council on Academic Accreditation of the American Speech-Language-Hearing Association. Enrollment in graduate courses in communication disorders is limited to individuals in good standing in the Graduate School. In addition, the licensure courses in the communication disorders curriculum are restricted to CD majors. To complete a course of study, each student must meet the program's academic and clinical competency criteria, as well as the recommendation of state and national certifying bodies for educational licensure and clinical certification. Only those courses in which a grade of B or higher has been earned will apply toward the program of study. If a student earns lower than a B grade in any course, he or she will meet with the Communication Disorders Graduate Faculty Selective Review Committee to determine a consequential course of action before proceeding with the next module of the program.

Admission to the department's M.A. programs is based on the evaluation of a portfolio of materials that includes:

- Undergraduate GPA
- Graduate GPA (if applicable)
- Psychometric score on the Miller Analogies Test or the Graduate Record Exam (aptitude portion) for SPED program applicants
- Psychometric score on the Graduate Record Exam (aptitude portion) for CD program applicants
- An academic vita
- A one-page letter of interest in which the candidate cites relevant background experiences and personal motives for applying to the program
- Three letters of reference
- Other optional materials (as available) such as samples of writing, evidence of scholarship, indication of membership in a group traditionally underrepresented in graduate programs, or extenuating factors highlighted by applicants in their letters of interest.

The department offers three advanced degrees in curriculum and instruction with emphasis in special education: the Specialist in Education (Ed.S.), Doctor of Education (Ed.D.), and Doctor of Philosophy (Ph.D.).

The Ed.S. provides additional study beyond the M.A. to prepare the student for leadership roles within his or her field. An Ed.S. degree can be earned in School Psychology. An Ed.S. project is required.

The Ed.D. program is designed to provide advanced professional training and to develop further ability in the scholarly study of professional problems. This program is intended primarily for students pursuing careers that emphasize teaching, administration, and service delivery.

The Ph.D. program has a theoretical and research orientation requiring the student to demonstrate competency with two of the following research tools: (a) advanced statistics, (b) computer language, and (c) foreign language.

The residency requirements for the Ed.D. and Ph.D. are described in the section "Requirements for Higher Degrees." "Three years' teaching experience, or the equivalent, is required for admission to doctoral programs. Applicants for the Ed.S. degree must have at least one year of successful teaching experience prior to receiving the degree.

The following psychometric scores are required for admission to the Ed.D. and Ph.D. programs: Miller Analogies Test and Graduate Record Examination (aptitude).

For detailed information on admission requirements, stipends, and program requirements, write to the Department of Special Education/Communication Disorders, MSC 3SPE, NMSU, P.O. Box 30001, Las Cruces, New Mexico 88003-8001.

COMMUNICATION DISORDERS

- | | |
|--|-------|
| C D 452. Speech Disorders | 3 cr. |
| Bases, symptoms, etiologies, and clinical management of issues related to disorders of articulation, phonology, voice and resonance, and fluency. Prerequisites: C or better in C D 380/C D 503, C D 453, and C D 462, or consent of instructor. Restricted to majors. | |
| C D 453. Language Disorders | 3 cr. |
| Bases, symptoms, etiologies, and treatment of language disorders. | |

- Includes review of normal language acquisition. Prerequisites: C or better in C D 321, C D 370/ C D 502, and C D 390/ C D 501, or consent of instructor. Restricted to majors.
- C D 456. Neural Bases of Communication Disorders 3 cr.
Study of the neuroanatomy and neurophysiology of communication and communication disorders. Includes review of the central nervous system and peripheral nervous system relationship to speech motor control, language, and hearing. Prerequisites: C or better in C D 380/ C D 503, C D 453, and C D 462, or consent of instructor.
- C D 462. Clinical Procedures 3 cr.
Guidelines and procedures associated with the clinical and supervisory processes. Provide opportunities to complete the supervised clinical observation requirement for participation in clinical practicum. Requires attendance at the weekly clinical staff meeting. Prerequisites: C or better in C D 321, C D 370/ C D 502, C D 390/ C D 501, passing the oral and written competency exam, and minimum 3.0 GPA, or consent of instructor. Restricted to majors.
- C D 463. Audiology 3 cr.
Anatomy and physiology of the auditory system, bases of auditory disorders, and basic audiometric procedures. Prerequisite: C or better in C D 380/503, C D 453, C D 462 and a minimum of 3.0 GPA or consent of instructor.
- C D 464. Aural Rehabilitation (S) 3 cr.
Anatomy and physiology of the auditory system, review of auditory disorders. Review of the bases and psychosocial aspects of hearing loss. Clinical management of hearing loss consistent with ASHA's scope of practice for SLP. Prerequisites: C or better in C D 456, and C D 481, or consent of instructor.
- C D 476. American Sign Language III 3 cr.
Continuation of C D 375, ASL II. Focus on more complex grammatical features. Students will comprehend and generate medium length stories, narratives, and discussions including culturally significant topics. Prerequisite: C D 375.
- C D 479. Clinical Practicum 3 cr.
Supervised speech, language, and hearing clinical practice with assigned clients at the NMSU Speech and Hearing Center. Requires attendance at the weekly clinical staff meeting. Prerequisites: C or better in C D 380/ C D 503, C D 453, and C D 462, and minimum 3.0 GPA or consent of instructor. May be repeated for a maximum of 6 credits. Restricted to majors.
- C D 490. Training in Professional Teamwork 3 cr.
Team development including critical thinking, problem solving, and decision making. Prerequisites: C or better in C D 452, C D 456, and C D 481, and minimum 3.0 GPA, or consent of instructor.
- C D 491. Selected Topics 1-6 cr.
Individual and/or group study of selected topics. To be identified by subtitle. Prerequisite: prior arrangement with faculty. May be repeated for a maximum of 12 credits.
- C D 501. Phonetics 3 cr.
The science of phonetics, including work with the International Phonetic Alphabet. Prerequisites: a course grade of B- or higher in all graduate courses and an overall GPA of 3.0 or higher. Restricted to majors. Same as C D 390 with differentiated assignments for graduate students.
- C D 502. Anatomy and Physiology of Speech Mechanisms 3 cr.
Structure and function of systems underlying human speech sound production and processing including nervous, respiratory, and articulatory components. Prerequisites: a course grade of B- or higher in all graduate courses and an overall GPA of 3.0 or higher. Restricted to majors. Same as C D 370 with differentiated assignments for graduate students.
- C D 503. Speech Science 3 cr. (2+3P)
Basic concepts and theories in acoustics, speech production, and speech perception. Laboratory experience with instrumental measurement and analysis of speech systems. Prerequisites: a course grade of B- or higher in all graduate courses and an overall GPA of 3.0 or higher. Restricted to majors. Same as C D 380 with differentiated assignments for graduate students.
- C D 505. Research Methods 3 cr.
Introduction to basic qualitative, quantitative, and single subject research methodology in speech-language pathology and audiology. Prerequisites: a course grade of B- or higher in all graduate courses and an overall GPA of 3.0 or higher. Restricted to majors.
- C D 509. Language Acquisition 3 cr.
Normal development of communication across the age span. Includes language sampling and analysis. A minimum grade of B- in all graduate courses and a minimum overall GPA of 3.0 required. Taught with C D 360 with differentiated assignments for graduate students. Restricted to CD majors and LING majors majors.
- C D 521. Professional Issues and Practices in Communication Disorders 3 cr.
This course includes a range of topics pertinent to students entering professional practice as speech-language pathologists including current legal, ethical, and clinical service provision issues. Restricted to majors. Prerequisites: minimum of 3.0 in all graduate courses required.
- C D 523. Assessment of Communication Disorders 3 cr.
Diagnostic theories and management of communication disorders using standardized and descriptive methodology. Includes the practice of interviewing, testing, and oral and written reporting. Prerequisites: a course grade of B- or higher in all graduate courses and an overall GPA of 3.0 or higher. Restricted to majors.
- C D 525. Pediatric Language and Disorders 3 cr.
Normal communication development of neonates, infants, toddlers, and preschoolers; etiologies, and treatment of cognitive, linguistic and social elements of communication problems in family systems. Prerequisites: minimum grade of B- and an overall GPA of 3.0 or higher. Restricted to majors.
- C D 530. School Age Language and Disorders 3 cr.
Normal communication-learning development of elementary, secondary, and postsecondary students; etiologies, diagnosis, and treatment of interpersonal communication and language-based academic disorders. Prerequisites: a minimum grade of B- in all graduate courses and an overall GPA of 3.0 or higher. Restricted to majors.
- C D 535. Aphasia 3 cr.
Etiologies, diagnosis, assessment, and treatment of adult aphasia. Prerequisites: a course grade of B- or higher in all graduate courses and an overall GPA of 3.0 or higher. Restricted to majors.
- C D 542. Articulation and Phonological Disorders 3 cr.
Advanced study of the symptoms, etiologies, assessment, and clinical management of articulation and phonological disorders. Prerequisites: a minimum grade of B- in all graduate courses and a minimum overall GPA of 3.0 is required. Restricted to majors.
- C D 545. Developmental Disabilities/Augmentative and Alternative Communication 3 cr.
Assessment and intervention for children and adults with developmental disabilities; Alternative communication strategies and systems for individuals with severe speech and/or language impairments. Prerequisite: Graduate standing; overall GPA of 3.0 or higher.
- C D 546. Speech-Language Pathology and Audiology Conference Procedures 3 cr.
Interviewing and counseling strategies used in the diagnosis, treatment, and management of speech, language, and hearing disorders. Prerequisites: a course grade of B- or higher in all graduate courses and an overall GPA of 3.0 or higher. Restricted to majors.
- C D 547. Cognitive-Linguistic Communication Disorders 3 cr.
Etiologies, diagnosis, assessment, and treatment of communication disorders associated with TBI, right-hemisphere syndrome, and dementia. Prerequisites: a course grade of B- or higher in all graduate courses and an overall GPA of 3.0 or higher.
- C D 548. Best Practices in Bilingual/Multicultural Assessment for Practitioners 3 cr.
The purpose of this course is to provide future speech-language pathologists, educational diagnosticians and special educators with a foundation for evaluating the linguistic, cognitive and academic skills of students from any cultural linguistic background. The course covers a review of the literature on best practices for working with interpreters during assessments. Practitioners will be expected to gather qualitative information about cultural/linguistic and educational histories of school-age children and integrate those results with the results of standardized tests. Prerequisite(s): C D 594.
- C D 574. American Sign Language III 3 cr.
Continuation of ASL II. Focus on more complex grammatical features. Students will comprehend and generate medium length stories, narratives, and discussions including culturally significant topics. Prerequisite: C D 375 or consent of instructor.
- C D 575. American Sign Language IV 3 cr.
Continuation of C D 476. Focus on more complex grammatical features and conversational skills. Skills built for in-depth conversion of English concepts into ASL structured expressions. In-depth knowledge of deaf culture as it relates to ASL. Prerequisites: C D 374, C D 375, and C D 574, or consent of instructor.
- C D 583. Dysphagia 3 cr.
Study of the anatomy and physiology of swallowing and upper aerodigestive systems. Review of the bases and etiologies of child and adult swallowing disorders, including diagnosis, assessment, and treatment. Prerequisites: a course grade of B- or higher in all graduate courses and an overall GPA of 3.0 or higher. Restricted to majors.

- C D 584. Fluency Disorders** 3 cr.
Speech fluency development and the disorders of stuttering, cluttering, and neurogenic dysfluency. Prerequisites: a course grade of B- or higher in all graduate courses and an overall GPA of 3.0 or higher. Restricted to majors.
- C D 585. Motor Speech Disorders** 3 cr.
Advanced studies of dysfunction of the nervous system that affect speech. Includes evaluation, diagnosis, and treatment of speech apraxias and dysarthrias. Prerequisites: a course grade of B- or higher in all graduate courses and an overall GPA of 3.0 or higher. Restricted to majors.
- C D 586. Voice Disorders/Head and Neck Anomalies** 3 cr.
Advanced studies of anatomy and physiology of the vocal tract with emphasis on diagnosis, assessment, and treatment of voice disorders, laryngectomy, cleft palate, and other oral-facial anomalies. Prerequisites: a course grade of B- or higher in all graduate courses and an overall GPA of 3.0 or higher. Restricted to majors.
- C D 589. Practicum in Speech-Language Pathology** 1-4 cr.
Supervised clinical practice in a variety of speech, language, and hearing disorders. Practicum includes diagnostic, treatment, and management work through direct patient/client contact. Attendance at weekly clinical staff meetings is required. Prerequisite: good standing in the graduate school; a course grade of B- or higher in all graduate courses and an overall GPA of 3.0 or higher. May be repeated for a maximum of 15 credits. Restricted to majors.
- C D 591. Special Topics** 1-9 cr.
Individual and/or group study of special topics identified by subtitle. Prerequisite: prior arrangement with faculty; a course grade of B- or higher in all graduate courses and an overall GPA of 3.0 or higher. May be repeated for a maximum of 9 credits.
- C D 593. Professional Reasoning and Scientific Thinking** 3 cr.
Overview of constructive thinking, problem solving, and decision making theories and strategies associated with professional reasoning and scientific thinking that are to be used academically and clinically in the transition from student to scholar to professional. Restricted to majors. Same as C D 393 except for differentiated assignments for graduate students. Prerequisites: a course grade of B- or higher in all graduate courses and an overall GPA of 3.0 or higher.
- C D 594. Cultural/Linguistic Identity and Second Language Acquisition for Practitioners** 3 cr.
The focus of this course is on the relationship between an individual's cultural/linguistic identity and efficacy of acquiring a second language. Major theories of second language acquisition will be covered from a cultural perspective, as well as the individual's affective and emotional connections to his/her first language. Prerequisite(s): A grade of B- or higher in all graduate courses and a minimum overall GPA of 3.0.
- C D 598. Special Research Programs** 1-6 cr.
Individual investigations either analytical or experimental.
- C D 599. Master's Thesis** 0-88 cr.
Thesis.
- C D 640. Internship in Communication Disorders** 3-6 cr.
The dissertation credit will allow doctoral students to be placed in a variety of clinical and/or supervisory settings. Assignments will be made in conjunction with the student's advisor. Consent of instructor required. May be repeated up to 6 credits.
- C D 690. Doctoral Seminar** 1-4 cr.
The seminar will engage doctoral students in scholarly dialogue and production. It will assist in preparing them for future careers in leadership roles. Same as SPED 690.
- C D 700. Dissertation** 3-6 cr.
The dissertation credit will allow doctoral students to conduct studies that are relevant to the field of communication disorders. Consent of instructor required. May be repeated up to 18 credits. Restricted to CD majors.

SPECIAL EDUCATION

- SPED 450. Working with Young Children with Special Needs, Ages 3-8** 3 cr.
Addresses competencies for working with young children with exceptionalities, ages three-eight, and their families. Public school, private school, Head Start and other models are included. Taught with SPED 550. Prerequisite(s): SPED 350 or equivalent.
- SPED 451. Assessment of Young Children, Birth-Eight** 3 cr.
Covers instruments and procedures for assessing young children and their families in order to determine atypical development. Screening, diagnosis, program planning, placement and evaluation issues are covered. Prerequisite: SPED 450. Same as SPED 551.
- SPED 452. Foundations of Visual Impairment** 3 cr.
Provides the history and theory of teaching students with visual impairments and multiple disabilities. An overview of educational, historical, and

psychosocial effects of visual impairments on the individual and means of adapting with a visual impairment will be covered. Taught with SPED 532 and SPED 632 with differentiated assignments. Consent of instructor required.

- SPED 453. Anatomy and Functions of the Visual System** 3 cr.
This course will cover the structure and function of the eye and associated diseases and how vision is affected. Appropriate educational recommendations and functional vision assessment techniques will be emphasized. Taught with SPED 533 and SPED 633 with differentiated assignments. Consent of instructor required. Prerequisite(s): SPED 452 or consent of instructor.
- SPED 454. Visual Impairment with Multisensory Impairments** 3 cr.
This course is an overview of education services for the student with visual impairments and multiple sensory impairments. Emphasis is on curricula, communication, behavior management, inclusion, transition, and independent living. Taught with SPED 534 and SPED 634 with Differentiated assignments. Consent of instructor required. Prerequisite(s): SPED 452 or SPED 532 or SPED 632 or consent of instructor.
- SPED 455. Braille I: Literacy Skills for Students with Visual Impairments** 3 cr.
This course will cover the uncontracted and contracted literary braille code and methods of teaching braille to tactile readers. Taught with SPED 536 and SPED 636 with differentiated assignments. Consent of instructor required. Prerequisite(s): SPED 452 or SPED 453 or consent of instructor.
- SPED 457. Braille II: Literacy Skills for Students with Visual Impairments** 3 cr.
This course will cover the Nemeth braille code for mathematics, the abacus, the use of technology for braille, foreign language, music and braille translation programs. Taught with SPED 538 and SPED 638 with differentiated assignments. Consent of instructor required. Prerequisite(s): SPED 455 or SPED 536 or SPED 636 or Consent of Instructor.
- SPED 458. Intellectual Disabilities in a Diverse Society: An Introduction** 3 cr.
Dealing with history, philosophy, goals and objectives, classification, and characteristics of intellectual disabilities. Taught with SPED 558 and SPED 658 with differentiated assignments. Consent of instructor required. Prerequisite(s): SPED 350 or SPED 500 or consent of instructor. Restricted to SPED majors.
- SPED 459. Classroom Management for Diverse Learners** 3 cr.
Behavior-change strategies for exceptional learners.
- SPED 460. Instructional Strategies of Teaching Visually Impaired** 3 cr.
This course covers assessment, curricular adaption's, knowledge of transition age, young children with multiple disabilities, and assistive technology. Prerequisite: Braille I, Braille II and Consent of Instructor. Consent of instructor required. Prerequisite(s): Braille I and Braille II and consent of instructor.
- SPED 463. Introduction to Assessment of Diverse Exceptional Learners** 3 cr.
Theory and use of norm and criterion-referenced instruments and learning theories in the classroom; planning of prescriptive instructional programs.
- SPED 464. Working with Young Children with Special Needs, Ages Birth-2** 3 cr.
Provides competencies for working with infants and toddlers (birth-2) with exceptionalities and their families. Neo-natal, home-based, and community-based programs and issues are included. Same as ECED 465 and SPED 564.
- SPED 466. The Learning Disabled Student in a Diverse Society** 3 cr.
Current definitions, conceptualizations, and techniques. Taught with SPED 566 SPED 666 with differentiated assignments. Prerequisite(s): SPED 350 or 500 or consent of instructor. Restricted to SPED majors.
- SPED 467. Behavior Disorders in a Diverse Society** 3 cr.
An in-depth study of the classification, characteristics, educational needs, and professional literature regarding individuals with behavior disorders. Taught with SPED 567 and SPED 667 with differentiated assignments. Prerequisite(s): SPED 350 or SPED 500 or consent of instructor. Restricted to SPED majors.
- SPED 469. Experiential Learning in Career/Technical Education for Exceptional in a Diverse Society** 3 cr.
Addresses the planning, delivering and evaluation of experiential learning activities for students with special needs. Specific strategies for working with students with special needs in a shop or laboratory setting within the Career and Technical Education environment will be included. Taught with AXED 569 and SPED 569. Prerequisite(s): SPED 350. Crosslisted with: AXED 469
- SPED 470. Life Span Development and Transition in a Diverse Society** 3 cr.
Special problems associated with transitions over the life span, with emphasis on adolescent and adult needs. Attention to service approaches for public schools, sheltered workshops, residential hospitals, and group homes.

- SPED 480. Secondary Curriculum, Methods, and Materials for Special Education in a Diverse Society** 3 cr.
Curriculum theory and development for elementary special education programs. Various teaching methods utilized with secondary exceptional learners and techniques for identifying, adapting, and developing materials will be addressed. Taught with SPED 580.
- SPED 481. Practicum in Education, Equity and Cultural Diversity** 2-6 cr.
Supervised experience in special education settings. One semester (2 credits) required. Prerequisite(s): SPED 350 and SPED 360 or consent of instructor.
- SPED 482. Student Teaching SPED** 1-12 cr.
Supervised teaching in a special education classroom and participation in a required seminar. Prerequisite: SPED 481 and admission to student teaching. May be repeated for a maximum of 6 credits. Restricted to special education majors. Same as SPED 582.
- SPED 483. Early Childhood SPED Student Teaching** 6 cr.
A student teaching experience designed for students studying early childhood special education. Prerequisites: SPED 281 and admission to student teaching. Restricted to majors. Same as SPED 583.
- SPED 485. Introduction to Autism** 3 cr.
This course will provide an overview of autism spectrum disorders as a triad of impairments, including historical and theoretical perspectives, assessment issues, characteristics of autism, intervention programs, and family issues. Taught with SPED 585 and SPED 685.
- SPED 486. Behavior and Autism** 3 cr.
This course will cover the first of the triad of impairments. Students will gain an understanding of the behaviors of children with autism. Students will examine several behavior management philosophies and research based interventions and how they can be applied in the educational setting. Attention will also be given to play skills. The family perspective and participation in the proactive behavior management process will be incorporated throughout the course. Taught with SPED 586 and SPED 686 with differentiated assignments. Consent of instructor required. Pre/Corequisite(s): SPED 485 or SPED 585 or SPED 685.
- SPED 487. Social Skills and Autism** 3 cr.
This course will cover the second of the triad of impairments. As a blend of researched based models and evidenced based practical applications, students will gain an understanding of the social skill deficits often associated with autism spectrum disorders. Review a variety of social cognition theories and explore effective social skill interventions for children functioning at a variety of levels along the autism spectrum. Taught with SPED 587 and SPED 687 with differentiated assignments. Consent of instructor required. Pre/Corequisite(s): SPED 485 or SPED 585 or SPED 685.
- SPED 488. Communication and Autism** 3 cr.
This course will cover the third of the triad of impairments. Students will gain an overview of communication characteristics and difficulties often associated with autism spectrum disorders. Review current tools and strategies used to assess speech, language, and interaction skills. Use assessment results to identify needs and implement appropriate interventions. Explore a variety of intervention strategies aimed at building receptive, expressive, and pragmatic language of children functioning at a variety of levels along the autism spectrum. Taught with SPED 588 and SPED 688 with differentiated assignments. Consent of instructor required. Prerequisite(s): SPED 485 or SPED 585 or SPED 685.
- SPED 489. Topics** 3 cr.
Offered under various subtitles which indicate the subject matter to be covered. May be repeated 3 times for a maximum of 9 credits.
- SPED 495. Directed Study courses in Special Education** 1-3 cr.
Each course shall be identified by a qualifying subtitle. A maximum of 3 credits per semester and a grand total of 9 credits.
- SPED 495 H. Directed Study Courses in Special Education.** 1-3 cr.
Designed for students in the honors program. Each course will be identified by a qualifying subtitle. A maximum of 3 credits in any one semester and a grand total of 6 credits.
- SPED 500. Introduction to Special Education in a Diverse Society** 3 cr.
This course introduces the field of special education to regular educators.
- SPED 501. Topics in Special Education** 1-3 cr.
Offered under various subtitles which indicate the subject matter to be covered. Maximum of 6 credits, 3 credits per semester.
- SPED 502. Problems** 1-3 cr.
Offered under various subtitles which indicate the subject matter to be covered. Maximum of 6 credits, 3 credits per semester.
- SPED 503. Contemporary Development** 1-3 cr.
Offered under various subtitles which indicate the subject matter to be covered. Maximum of 6 credits, 3 credits per semester.
- SPED 504. Introduction to Assessment of Diverse Exceptional Learners** 3 cr.
Required for students seeking licensure at graduate level. Theory and use of norm-and criterion-referenced instruments and learning theories in the classroom; planning of prescriptive instructional programs with differentiated assignments for graduate students.
- SPED 505. Appraisal of Psychoeducational Achievement in a Diverse Society** 3 cr.
Advanced theory and use of norm and criterion referenced instruments in the classroom: planning of prescriptive and educational programs. Prerequisite: SPED 463 or 504. Restricted to majors.
- SPED 506. High Incidence Disabilities in a Diverse Society** 3 cr.
Examines those areas of disability that most frequently occur in the special education population, including mental retardation, learning disabilities, communication disorders, and behavioral and emotional disorders.
- SPED 507. Low Incidence Disabilities in a Diverse Society** 3 cr.
Examines those disabilities that occur less frequently in the special education population, including hearing loss, visual disorders, autism, and other severe manifestations. Taught with SPED 607 with differentiated assignments.
- SPED 509. Reading for Elementary Exceptional Learners in a Diverse Society, K-6** 3 cr.
Emphasizes reading diagnosis and materials for students with special developmental and learning problems. Taught with SPED 409.
- SPED 510. Current Issues in Special Education for Teaching in Culturally Responsive Society** 3 cr.
Theoretical and empirical bases for special education practices. Skill development in critical thinking, reading, and writing in relation to contemporary problems. Taught with SPED 610.
- SPED 511. Reading for Secondary Exceptional Learners in a Diverse Society, 7-12** 3 cr.
Extends information covered in SPED 509, which covers grades K 6. Strategies and materials are addressed. Taught with SPED 411.
- SPED 513. Current Research in Special Education** 3 cr.
Current investigations and research techniques.
- SPED 515. Working with Families of Exceptional Learners in a Diverse Society** 3 cr.
Methods and techniques for educators and other professionals in parent-professional relationships. Emphasis is placed on young children. Taught with SPED 415.
- SPED 519. School Interventions and Organization in a Diverse Society** 3 cr.
Introduces public school organization and laws and the psycho-sociological perspective of education. Curriculum and theory, teaching methods and materials will be presented and operationalized through a psycho-educational point of view. Restricted to majors. Taught with SPED 619.
- SPED 523. Advanced Curriculum for Diverse Exceptional Learners** 3 cr.
Strategies for developing curricula appropriate to handicapped and gifted learners. Prerequisite: SPED 360 or consent of instructor.
- SPED 524. Foundations of Education for Deaf & Hard of Hearing Students** 3 cr.
An examination of historic and current developments in the education of the deaf and hard of hearing including: sound sensation/perception, cognition/intelligence, language/literacy, memory, psychosocial development, counseling, culture, and assessment. Taught with SPED 424 & SPED 622 with differentiated assignments.
- SPED 525. Language Development for Deaf and Hard of Hearing Students** 3 cr.
Developmental approach to language learning for individuals with hearing impairments including linguistic and cognitive potential, assessment and intervention strategies, and reading language. Taught with SPED 425 and SPED 623 with differentiated assignments. Prerequisite(s): C D 509.
- SPED 526. Teaching Content Subjects to Preschool-Twelfth Grade for Deaf and Hard of Hearing Students** 3 cr.
Curriculum and instructional procedures common to education of hearing impaired including reading, adaptations to regular curriculum, methods for planning, implementing, and translating diagnostic information into programming. Taught with SPED 426 & SPED 626 with differentiated assignments. Prerequisite(s): SPED 524.
- SPED 527. Internship in Education of the Deaf and Hard of Hearing** 1-6 cr.
Supervised internship in a deaf education classroom. Prerequisite: student teaching. May be repeated for a maximum of 6 credits. Restricted to deaf education majors.
- SPED 528. Deafness: Psychological Theories, Assessments, and Accommodations** 3 cr.
Developmental psychological and cognitive theories related to deafness. Assessment issues and accommodations for assessment of deaf and hard-of-hearing children. Restricted to majors. Taught with SPED 428 and SPED 628 with differentiated assignments. Prerequisite(s): SPED 524 or consent of instructor.
- SPED 529. Literacy and Deafness** 3 cr.
Covers literacy development framework. Methods for teaching reading and writing and for assessment of reading and writing skills in deaf and hard-of-

hearing children. Taught with SPED 429 and SPED 629 with differentiated assignments. Restricted to majors. Prerequisite(s): SPED 524 or consent of instructor.

- SPED 532. Foundations of Visual Impairment 3 cr.
Provides the history and theory of teaching students with visual impairments and multiple disabilities. An overview of educational, historical, and psychosocial effects of visual impairments on the individual and means of adapting with a visual impairment will be covered. Taught with SPED 452 and SPED 632 with differentiated assignments. Consent of instructor required.
- SPED 533. Anatomy and Functions of the Visual System 3 cr.
This course will cover the structure and function of the eye and associated diseases and how vision is affected. Appropriate educational recommendations and functional vision assessment techniques will be emphasized. Taught with SPED 453 and SPED 633 with differentiated assignments. Consent of instructor required. Prerequisite(s): SPED 532 or consent of instructor.
- SPED 534. Visual Impairment with Multisensory Impairments 3 cr.
This course is an overview of education services for the student with visual impairments and multiple sensory impairments. Emphasis is on curricula, communication, behavior management, inclusion, transition, and independent living. Taught with SPED 454 and SPED 634 with differentiated assignments. Consent of instructor required. Prerequisite(s): SPED 532 or consent of instructor.
- SPED 536. Braille I: Literacy Skills for Students with Visual Impairments 3 cr.
This course will cover the uncontracted and contracted literary braille code and methods of teaching braille to tactile readers. Taught with SPED 455 and SPED 636 with differentiated assignments. Consent of instructor required. Prerequisite(s): SPED 532 or SPED 533 or consent of instructor.
- SPED 537. Independent Readings in Special Education 1-3 cr.
Each course shall be identified by a qualifying subtitle. Maximum of 6 credits, 3 credits per semester.
- SPED 538. Braille II: Literacy Skills for Students with Visual Impairments 3 cr.
This course will cover the Nemeth braille code for mathematics, the abacus, the use of technology for braille, foreign language, music and braille translation programs. Taught with SPED 457 and SPED 638 with differentiated assignments. Consent of instructor required. Prerequisite(s): SPED 455 or SPED 536 or SPED 636 consent of instructor.
- SPED 539. Instructional Strategies of Teaching Visually Impaired 3 cr.
This course covers assessment, curricular adaption's, knowledge of transition age, young children with multiple disabilities, and assistive technology. Taught with SPED 460 and SPED 639 with differentiated assignments. Consent of instructor required. Prerequisite(s): Braille I and Braille II and Consent of instructor.
- SPED 545. Technology and Exceptionality in a Diverse Society 3 cr.
This class will address the unique educational needs of learners with exceptionalities, and will provide information and practice in addressing those needs through the use of technology-based interventions. Taught with SPED 645.
- SPED 548. Field Experience in Education, Equity & Cultural Diversity 1-3 cr.
Supervised experience for the advanced student. Designed for both the practicing classroom teacher and nonteaching graduate student. May be repeated for a maximum of 6 credits. Prerequisite(s): SPED 350 and SPED 360, or SPED 500 and SPED 523, or consent of instructor.
- SPED 550. Working with Young Children with Special Needs, Ages 3-8 3 cr.
Addresses competencies for working with young children with exceptionalities, ages three eight, and their families. Public school, private school, Head Start and other models are included. Prerequisite: SPED 500 or equivalent, or consent of instructor. Same as SPED 450 with differentiated assignments for graduate students. Same as ECED 550.
- SPED 551. Assessment of Young Children, Birth Eight 3 cr.
Covers instruments and procedures for assessing young children and their families in order to determine atypical development. Screening, diagnosis, program planning, placement and evaluation issues are covered. Prerequisite: SPED 550 or consent of instructor. Same as SPED 451.
- SPED 552. Introduction to Orientation and Mobility 3 cr.
The history and philosophy of orientation and mobility. The impact of visual impairment and other impairments to concept motor development, travel techniques, tactual maps, structured pre-cane orientation, and mobility assessment and instruction are covered. Prerequisite: consent of instructor. Restricted to majors.
- SPED 553. Beginning Orientation and Mobility 3 cr.
Systems of orientation and mobility, indoor, and outdoor beginning cane techniques, and overview of the profession of orientation and mobility. Prerequisite: consent of instructor. Restricted to majors.
- SPED 554. Intermediate Orientation and Mobility 3 cr.
Intermediate skill development in outdoor cane travel including residential and small business districts. Strategies and methods necessary to conduct assessments and appropriate sequencing of skill acquisition based on individual needs. Prerequisite: consent of instructor. Restricted to majors.
- SPED 555. Advanced Orientation and Mobility 3 cr.
Advanced skill development in the development, administration, and supervision of orientation and mobility programs. Advanced cane skills including transportation systems and large business districts will be covered. Prerequisite: consent of instructor. Restricted to majors.
- SPED 558. Intellectual Disabilities in a Diverse Society: An Introduction 3 cr.
Dealing with history, philosophy, goals and objectives, classification, and characteristics of intellectual disabilities. Same as SPED 458 and SPED 558 with differentiated assignments for graduate students. Consent of instructor required. Prerequisite(s): SPED 350 or SPED 500. Restricted to SPED majors.
- SPED 559. Classroom Management for Diverse Learners 3 cr.
Behavior-change strategies for exceptional learners. Taught with SPED 459 with differentiated assignments for graduate students.
- SPED 561. The Bilingual Exceptional Student 3 cr.
Introduction to the field of bilingual/multicultural special education. Same as BIL 561, BIL 661, SPED 661.
- SPED 562. Elementary Curriculum Methods and Materials for Special Education in a Diverse Society 3 cr.
ESL and bilingual methods applied to bilingual exceptional students. Appropriate curriculum needs and materials development are also included. Taught with SPED 360, SPED 662.
- SPED 563. Assessment and Consultation for Exceptional Multicultural Populations 3 cr.
Covers formal and informal methods of assessment as well as consultation models for multicultural populations. Same as BIL 563, BIL 663, SPED 663.
- SPED 564. Working with Young Children with Special Needs, Birth-Two 3 cr.
Provides competencies for working with infants and toddlers (birth two) with exceptionalities and their families. Neonatal, home-based, and community-based programs and issues are included. Prerequisite: SPED 500 or equivalent, or consent of instructor. Same as SPED 464 and ECED 465 with differentiated assignments for graduate students.
- SPED 565. Sociocultural Perspectives in Bilingual/Multicultural SPED 3 cr.
Covers a discussion of current issues impacting the education of exceptional minority students. Same as BIL 565, BIL 665, SPED 665.
- SPED 566. The Learning Disabled Student in a Diverse Society 3 cr.
Current definitions, conceptualizations, and techniques. Taught with SPED 466 with differentiated assignments for graduate students. Prerequisite(s): SPED 350 or SPED 500. Restricted to SPED majors.
- SPED 567. Behavior Disorders in a Diverse Society 3 cr.
An in-depth study of the classification, characteristics, educational needs, and professional literature regarding individuals with behavior disorders. Taught with SPED 467 and SPED 667 with differentiated assignments. Prerequisite(s): SPED 350 or SPED 500 or consent of instructor. Restricted to SPED majors.
- SPED 569. Experiential Learning in Career/Technical Education for Exceptional Learners in a Diverse Society 3 cr.
Addresses the planning, delivering and evaluation of experiential activities for students with special needs. Specific strategies for working with students with special needs in a shop or laboratory setting within the Career and Technical Education environment will be included. Taught with SPED 469 and AXED 469. Prerequisite(s): SPED 350 or SPED 500. Crosslisted with: AXED 569.
- SPED 570. Life Span Development and Transition in a Diverse Society 3 cr.
Covers special problems associated with transitions over the life span, with emphasis on adolescent and adult needs. Attention to service approaches for public schools, sheltered workshops, residential hospitals, and group homes. Taught with SPED 470.
- SPED 580. Curriculum, Methods, and Materials for Secondary Special Education 3 cr.
Curriculum theory and development for elementary special education programs. Various teaching methods utilized with secondary exceptional learners and techniques for identifying, adapting, and developing materials will be addressed. Taught with SPED 480.
- SPED 582. Student Teaching SPED 1-12 cr.
Required for students seeking licensure at graduate level. May be repeated for a maximum of 6 credits. Prerequisites: bachelor's degree, SPED 548, and admission to student teaching. Restricted to majors. Same as SPED 482 with differentiated assignments for graduate students.
- SPED 583. Early Childhood SPED Student Teaching 6 cr.
A student teaching experience designed for students studying early child-

- hood special education. Prerequisites: SPED 281 and admission to student teaching. Restricted to majors. Same as SPED 483 with differentiated assignments for graduate students.
- SPED 585. Introduction to Autism 3 cr.
This course will provide an overview of autism spectrum disorders as a triad of impairments, including historical and theoretical perspectives, assessment issues, characteristics of autism, intervention programs, and family issues. Taught with SPED 485 and SPED 685. Differentiated Assignments.
- SPED 586. Behavior and Autism 3 cr.
This course will cover the first of the triad of impairments. Students will gain an understanding of the behaviors of children with autism. Students will examine several behavior management philosophies and research based interventions and how they can be applied in the educational setting. Attention will also be given to play skills. The family perspective and participation in the proactive behavior management process will be incorporated throughout the course. Taught with SPED 486 and SPED 686 with differentiated assignments. Consent of instructor required. Prerequisite(s): SPED 485 or SPED 585 or SPED 685.
- SPED 587. Social Skills and Autism 3 cr.
This course will cover the second of the triad of impairments. As a blend of researched based models and evidenced based practical applications, students will gain an understanding of the social skill deficits often associated with autism spectrum disorders. Review a variety of social cognition theories and explore effective social skill interventions for children functioning at a variety of levels along the autism spectrum. Taught with SPED 487 and SPED 687 with differentiated assignments. Consent of instructor required. Prerequisite(s): SPED 485 or SPED 585 or SPED 685. Crosslisted with: SPED
- SPED 588. Communication and Autism 3 cr.
This course will cover the third of the triad of impairments. Students will gain an overview of communication characteristics and difficulties often associated with autism spectrum disorders. Review current tools and strategies used to assess speech, language, and interaction skills. Use assessment results to identify needs and implement appropriate interventions. Explore a variety of intervention strategies aimed at building receptive, expressive, and pragmatic language of children functioning at a variety of levels along the autism spectrum. Taught with SPED 488 and SPED 688 with differentiated assignments. Consent of instructor required. Prerequisite(s): SPED 485 or SPED 585 or SPED 685.
- SPED 598. Special Research Problems 1-3 cr.
Individual investigation either analytical or experimental. May be repeated for a maximum of 6 credits, 3 credits per semester.
- SPED 599. Master's Thesis 0-88 cr.
Thesis.
- SPED 600. Doctoral Research Research. 1-88 cr.
- SPED 603. Special Education in a Diverse Society 3 cr.
This course introduces the field of special education to Ph.D. students. Taught with SPED 500. Consent of instructor required. Prerequisite(s): MA Degree. Restricted to SPED & CD majors.
- SPED 605. Independent Study Topics in Special Education 1-6 cr.
A problem and seminar course for those pursuing an advanced graduate degree. Each course to bear an appropriate subtitle.
- SPED 606. High Incidence Disabilities in a Diverse Society 3 cr.
Examines those areas of disability that most frequently occur in the special education population, including mental retardation, learning disabilities, communication disorders, and behavioral and emotional disorders. Taught with SPED 506. Prerequisite(s): Master's Degree. Restricted to SPED and CD majors. Crosslisted with: SPED 506
- SPED 607. Low Incidence Disabilities 3 cr.
Examines those disabilities that occur less frequently in the special education population, including hearing loss, visual disorders, autism, and other severe manifestations. Taught with SPED 507 with differentiated assignments.
- SPED 610. Current Issues in Special Education for Teaching in a Culturally Responsive Society 3 cr.
Required for students seeking the Ed.D./Ph.D. Taught with SPED 510.
- SPED 613. Current Research in Special Education 3 cr.
Required for students seeking the Ed.D./Ph.D. Prerequisite: M.A. degree. Restricted to majors. Same as SPED 513.
- SPED 619. School Intervention and Organization in a Diverse Society 3 cr.
Introduces public school organization and laws and the psycho-sociological perspective of education. Curriculum and theory, teaching methods and materials will be presented and operationalized through a psycho-educational point of view. Restricted to majors. Taught with SPED 519.
- SPED 622. Foundations of Education for Deaf & Hard of Hearing 3 cr.
An examination of historic and current developments in the education of the deaf and hard of hearing including: sound sensation/perception, cognition/intelligence, language/literacy, memory, psychosocial development counseling, culture, and assessment. Taught with SPED 524 and SPED 622 with differentiated assignments.
- SPED 623. Language Development for Deaf & Hard of Hearing Students 3 cr.
Developmental approach to language learning for individuals with hearing impairments including linguistic and cognitive potential, assessment and intervention strategies, and reading language. Taught with SPED 425 and SPED 525 with differentiated assignments.
- SPED 626. Teaching Content Subjects to Preschool-Twelfth Grade for Deaf and Hard of Hearing Students 3 cr.
Curriculum and instructional procedures common to education of hearing impaired including reading, adaptations to regular curriculum, methods for planning, implementing, and translating diagnostic information into programming. Taught with SPED 426 and SPED 526 with differentiated assignments.
- SPED 628. Deafness: Psychological Theories, Assessments and Accommodations 3 cr.
Developmental psychological and cognitive theories related to deafness. Assessment issues and accommodations for assessment of deaf and hard-of-hearing children. Restricted to majors. Taught with SPED 428 and SPED 528 with differentiated assignments.
- SPED 629. Literacy and Deafness 3 cr.
Cover literacy development framework. Methods for teaching reading and writing skills in deaf and hard-of-hearing children. Taught with SPED 429 and SPED 529 with differentiated assignments.
- SPED 632. Foundations of Visual Impairment 3 cr.
Provides the history and theory of teaching students with visual impairments and multiple disabilities. An overview of educational, historical, and psychosocial effects of visual impairments on the individual and means of adapting with a visual impairment will be covered. Taught with SPED 452 and SPED 532 with differentiated assignments. Consent of instructor required.
- SPED 633. Anatomy and Functions of the Visual System 3 cr.
This course will cover the structure and function of the eye and associated diseases and how vision is affected. Appropriate educational recommendations and functional vision assessment techniques will be emphasized. Taught with SPED 453 and SPED 533 with differentiated assignments. Consent of instructor required. Prerequisite(s): SPED 632 or consent of instructor.
- SPED 634. Visual Impairment with Multisensory Impairments 3 cr.
This course is an overview of education services for the student with visual impairments and multiple sensory impairments. Emphasis is on curricula, communication, behavior management, inclusion, transition, and independent living. Taught with SPED 454 and SPED 534 with differentiated assignments. Consent of instructor required. Prerequisite(s): SPED 632 or consent of instructor.
- SPED 636. Braille I: Literacy Skills for Students with Visual Impairments 3 cr.
This course will cover the uncontracted and contracted literary braille code and methods of teaching braille to tactile readers. Taught with SPED 455 and SPED 536 with differentiated assignments. Consent of instructor required. Prerequisite(s): SPED 632 or SPED 633 or consent of instructor.
- SPED 638. 638 Braille II: Literacy Skills for Students with Visual Impairments 3 cr.
This course will cover the Nemeth braille code for mathematics, the abacus, the use of technology for braille, foreign language, music and braille translation programs. Taught with SPED 457 and SPED 538 with differentiated assignments. Consent of instructor required. Prerequisite(s): SPED 455 or SPED 536 or SPED 636.
- SPED 639. Instructional Strategies of Teaching Visually impaired 3 cr.
This course covers assessment, curricular adaption's, knowledge of transition age, young children with multiple disabilities, and assistive technology. Taught with SPED 460 and SPED 539 with differentiated assignments. Consent of instructor required. Prerequisite(s): Braille I and Braille II and consent of instructor.
- SPED 640. Internship in Special Education 1-6 cr.
Each course bears a qualifying subtitle. Maximum of 6 credits per semester.
- SPED 645. Technology and Exceptionality in a Diverse Society 3 cr.
This class will address the unique educational needs of learners with exceptionalities, and will provide information and practice in addressing those needs through the use of technology-based interventions. Taught with SPED 545.
- SPED 658. Intellectual Disabilities in a Diverse Society: An Introduction 3 cr.
Dealing with history, philosophy, goals and objectives, classification,

- and characteristics of intellectual disabilities. Taught with SPED 458 and SPED 558 with differentiated assignments. Consent of instructor required. Prerequisite(s): SPED 350 or SPED 500. Restricted to SPED majors.
- SPED 661. The Bilingual Exceptional Student 3 cr.
Same as BIL 561, BIL 661, SPED 561.
- SPED 662. Elementary Curriculum Methods and Materials for Special Education in a Diverse Society 3 cr.
ESL and bilingual methods applied to bilingual exceptional students. Appropriate curriculum needs and materials development are also included. Taught with SPED 360, SPED 562.
- SPED 663. Assessment and Consultation for Exceptional Multicultural Population 3 cr.
Covers formal and informal methods of assessment as well as consultation models for multicultural populations.
- SPED 665. Sociocultural Perspectives in Bilingual/Multicultural SPED 3 cr.
Same as BIL 565, BIL 665, SPED 565.
- SPED 666. The Learning Disabled Student in a Diverse Society 3 cr.
Current definitions, conceptualizations, and techniques. Taught with SPED 466 and SPED 566 with differentiated assignments. Prerequisite(s): SPED 350 or SPED 500. Restricted to SPED majors.
- SPED 667. Behavior Disorders in a Diverse Society 3 cr.
An in-depth study of the classification, characteristics, educational needs, and professional literature regarding individuals with behavior disorders. Taught with SPED 467 and SPED 567 with differentiated assignments. Prerequisite(s): SPED 350 or SPED 500 or consent of Instructor. Restricted to SPED majors.
- SPED 684. Internship in School Psychology 3-12 cr.
Supervised experience in school psychology. Prerequisites: SPED 672 and SPED 675, and consent of instructor. May be repeated for a maximum of 12 credits. Restricted to school psychology majors.
- SPED 685. Introduction to Autism 3 cr.
This course will provide an overview of autism spectrum disorders as a triad of impairments, including historical and theoretical perspectives, assessment issues, characteristics of autism, intervention programs, and family issues. Differentiated assignments. Taught with SPED 585 and SPED 485.
- SPED 686. Behavior and Autism 3 cr.
This course will cover the first of the triad of impairments. Students will gain an understanding of the behaviors of children with autism. Students will examine several behavior management philosophies and research based interventions and how they can be applied in the educational setting. Attention will also be given to play skills. The family perspective and participation in the proactive behavior management process will be incorporated throughout the course. Taught with SPED 486 and SPED 586 with differentiated assignments. Consent of instructor required. Prerequisite(s): SPED 485 or SPED 585 or SPED 685.
- SPED 687. Social Skills and Autism 3 cr.
This course will cover the second of the triad of impairments. As a blend of researched based models and evidenced based practical applications, students will gain an understanding of the social skill deficits often associated with autism spectrum disorders. Review a variety of social cognition theories and explore effective social skill interventions for children functioning at a variety of levels along the autism spectrum. Taught with SPED 487 and SPED 587 with differentiated assignments. Consent of instructor required. Pre/Corequisite(s): SPED 485 or SPED 585 or SPED 685.
- SPED 688. Communication and Autism 3 cr.
This course will cover the third of the triad of impairments. Students will gain an overview of communication characteristics and difficulties often associated with autism spectrum disorders. Review current tools and strategies used to assess speech, language, and interaction skills. Use assessment results to identify needs and implement appropriate interventions. Explore a variety of intervention strategies aimed at building receptive, expressive, and pragmatic language of children functioning at a variety of levels along the autism spectrum. Taught with SPED 488 and SPED 588 and differentiated assignments. Consent of instructor required. Prerequisite(s): SPED 485 or SPED 585 or SPED 685.
- SPED 690. Doctoral Seminar 1-4 cr.
The seminar will engage doctoral students in scholarly dialogue and production. It will assist in preparing them for future careers in leadership roles. Same as CD 690.
- SPED 693. Dissertation Seminar 3 cr.
Same as EMD 693, BIL 693, C EP 693, ECED 693, EDUC 693, RDG 693.
- SPED 698. Selected Topics in Special Education 1-6 cr.
Offered under various subtitles which indicate the subject matter to be covered. Maximum of 6 credits, 3 credits per semester.
- SPED 699. Ed.S. Thesis 1-88 cr.
Offered primarily for those pursuing the research requirements for the Ed.S. degree. Course may be repeated up to a maximum allowed for this degree. Each research project will be designated by a qualifying subtitle.
- SPED 700. Dissertation 0-9 cr.
Credit may be earned by students who have successfully completed their doctoral comprehensive exams and presented their dissertation proposals to their committees. At least 18 credits are required during the course of dissertation study. May be repeated for a maximum of 24 credits. Restricted to majors.

COLLEGE of ENGINEERING

Dean • *Ricardo Jaquez*

Associate Dean (Academic Programs) • *Krist Petersen*

Associate Dean/Director of Engineering Research Center • *Rudi Schoenmackers*

Assistant Dean (Development) • *Patricia Sullivan*

Scholarship and Career Development Coordinator • *Monica Lopez*

Communications and special Events coordinator • *Linda Fresques*

Enrollment Specialist • *Marcela Salmón*

CHEMICAL ENGINEERING

Department Website: <http://chemeng.nmsu.edu/>
(575) 646-1214
martmitc@nmsu.edu

*M. C. Mitchell**, department head, Ph.D. (Minnesota)-statistical mechanics, computer modeling and simulation, thermodynamic characterization of aerospace fuels; *P. K. Andersen*, Ph.D. (California-Berkeley)-chemical process simulation, engineering education, electrochemical systems; *S. Deng*, Ph.D. (Cincinnati)-adsorption, nanoporous materials, hydrogen fuel cell, water treatment; *A. Ghassemi*, Ph.D. (NMSU)-waste & environmental management and restoration, energy efficiency, pollution prevention, process control, risk assessment and decision theory; *J. Houston*, Ph.D. (Texas A & M)-biomedical engineering, biophotonics, flow cytometry; *C. L. Johnson*, D.Sc. (Washington University)-high-temperature polymers; *R. L. Long, Jr. **, Ph.D. (Rice)-bioengineering, fluid mechanics, separations, kinetics; *H. Luo*, Ph.D. (Tulane)- nanostructured materials, thin films, magnetism, electrochemistry, photovoltaics; *D. A. Rockstraw**, Ph.D. (Oklahoma)-chemical reaction engineering, novel separations, nanoporous materials.

*Registered Professional Engineer

DEGREE: Master of Science in Chemical Engineering

DEGREE: Doctor of Philosophy

MAJOR: Engineering

CONCENTRATION: Chemical Engineering

The Department of Chemical Engineering offers graduate study leading to the Master of Science degree and the Ph.D. with an emphasis in chemical engineering. Admission to the program is in accord with the general regulations of the Graduate School. The Graduate Record Examination (GRE) General Test is required for all applicants. All graduate students are required to pass all graduate engineering courses with a minimum grade of B.

DEGREE: Master of Science in Chemical Engineering

The graduate program is intended to provide advanced education in the fundamentals in chemical engineering. The program of study leading to the M.S. consists of 32 credits which includes required core courses (15 credits), tools courses (6 credits), a chemical engineering elective course (3 credits), thesis (6 credits), and graduate seminar (2 credits). The required courses are:

- CH E 501 – Intermediate Thermodynamics for Chemical Engineers (3 credits)
- CH E 506 – Intermediate Transport Phenomena (s) (3 credits)
- CH E 513 – Intermediate Chemical Engineering Data Analysis (s) (3 credits)
- CH E 516 – Numerical Methods in Chemical Engineering (3 credits)
- CH E 542 – Intermediate Reactor Analysis and Design (3 credits)
- CH E 590 – Graduate Seminar (2 credits: 1 credit/semester for two semesters)
- CH E 599 – Master's Thesis (6 credits)

The two tools courses must be selected from the list below, with one from Experimental Tools section and one from the Analytical Tools section. One chemical engineering elective must be selected from courses numbered 500-589. The thesis may be pursued in absentia at various industrial sites by special arrangement.

Students with backgrounds in other branches of engineering, biology, chemistry, physics, or other related sciences are also eligible for admission to graduate programs in the Department of Chemical Engineering. For applicants with undergraduate degrees in disciplines other than chemical engineering, undergraduate deficiency courses, which cannot be used towards the total credit requirement for the graduate degree, may be identified prior to admission and these classes must be passed with a minimum grade of B or better.

DEGREE: Doctor of Philosophy

MAJOR: Engineering

The program of study leading to the Ph.D. consists of 36 course credits and 18 dissertation credits which includes the required core courses (15 credits), tools courses (6 credits), two chemical engineering elective courses (6 credits), elective courses (6 credits), independent research (9 credits), dissertation (9 credits) and graduate seminar (3 credits). For students with an M.S. in chemical engineering, the additional program of study leading to the Ph.D. consists of a chemical engineering elective (3 credits), elective courses (6 credits), graduate seminar (1 credit), independent research (9 credits), and dissertation (9 credits). All Ph.D. students are required to pass a qualifying examination within 18 months of starting their Ph.D. studies and a comprehensive examination later. The dissertation must be defended before the doctoral committee and accepted by them.

The program of study leading to the Ph.D. is available to students who have either a B.S. or M.S. in chemical engineering. Students with only a B.S. will be required to complete the requirements for the M.S. described above (except for seminar and thesis courses) in addition to the Ph.D. requirements above.

Required Courses:

- CH E 690 – Graduate Seminar (3 credits: 1 credit/semester- for three semesters)
- CH E 700 – Doctoral Dissertation (minimum 9 credits)
- An Independent Research Program (minimum 9 credits)

The chemical engineering electives must be selected from courses numbered 500-589 or 600-689. The two elective courses must be letter-graded course work numbered 500 or greater (excluding seminar courses, individual study courses) from any engineering or natural science (e.g. Biology, Chemistry, Mathematics, Physics, Statistics) graduate program.

Courses which will satisfy the tools course electives are given below: If a student wishes the faculty to consider accepting another course as an experiment tools or analysis tools elective, they must submit a request in writing to the department head. The graduate faculty will then vote to approve or disapprove the request.

Experimental Tools

- A ST 505 – Statistical Inference I
- A ST 506 – Statistical Inference II
- BCHE 494 – Techniques in Genetic Engineering
- BIOL 506 – Biological Electron Microscopy
- BIOL 591 – Principles of Confocal Microscopy
- BIOL 592 – Microscopy Practicum
- CHEM 471 – Instrumental Methods of Analysis
- CHEM 472 – Analytical Methods for Toxic Organics and Metal Ions in the Environment
- CHEM 521 – Chemical Instrumentation
- CHEM 526 – Advanced Analytical Chemistry

CHEM 528 – Electroanalytical Techniques
 CHEM 529 – Spectrochemical Analysis
 CHEM 539 – Spectroscopy
 CHEM 606 – Physical Methods in Inorganic Chemistry
 GEOL 562 – Analytical Geochemistry

Analysis Tools

A ST 503 – SAS Basics
 A ST 504 – Statistical Software Applications
 C S 450 – C Programming
 C S 452 – Java Programming
 C S 475 – Artificial Intelligence I
 E E/ PHYS 577 – Fourier Methods in Electro-Optics
 MATH 517 – Complex Variables
 MATH 518 – Fourier Series and Boundary Value Problems
 MATH 519 – Calculus of Variations and Optimal Control
 MATH 531 – Ordinary Differential Equations
 MATH 532 – Partial Differential Equations
 PHYS 495 – Mathematical Methods of Physics I
 PHYS 496 – Mathematical Methods of Physics II

All graduate students must select a thesis or dissertation advisor by the end of their first semester in the chemical engineering graduate program. Graduate teaching and research assistantships, fellowships, and traineeships are available. For consideration for financial assistance, completed applications must be received by March 1. All support is contingent upon availability, eligibility and satisfactory progress toward the degree.

For further information on the Department of Chemical Engineering, please consult the web page <http://chemeng.nmsu.edu>.

CHEMICAL ENGINEERING

- CH E 451. Engineering Economy 3 cr.
 Discounted cash flows, economics of project, contract and specifications as related to engineering design. Same as I E 451.
- CH E 452. Chemical Process Design & Economic Evaluation 3 cr.
 Concepts in chemical engineering process design, including: capital and manufacture cost estimation; discounted cash flows; interest; taxes; depreciation; profitability analysis; project specifications. Prerequisite(s): CH E 307, CH E 441, and CH E 451.
- CH E 452 L. Chemical Process Simulation 1 cr. (3P)
 Construction and convergence of chemical processes in a process simulator. Students will understand how to access variables, define and converge design specifications and converge tear/recycle streams. Prerequisite(s): ChE 352L. Corequisite(s): ChE 452.
- CH E 455. Chemical Plant Design 3 cr.
 Analysis of integrated process plants. Design for optimum operability, reliability, safety, and control. Process analysis of performance, optimization, and energy integration (pinch technology). Requires individual solution of the AIChE student contest problem, or equivalent, according to rules of contest. Written report covering work is required. Prerequisite(s): CH E 452.
- CH E 455 L. Chemical Plant Simulation 1 cr. (3P)
 Construction, convergence, and optimization of chemical processes in a process simulator. Dynamic process simulation and control. Prerequisite(s): Ch E 412, Ch E 452L. Corequisite(s): ChE 455.
- CH E 456. Advanced Chemical Process Simulation 3 cr.
 Advanced techniques in computational simulation of chemical processes using process simulation software. Restricted to CH E majors. Prerequisite: CH E 452L or consent of instructor.
- CH E 464. Polymer Science 3 cr.
 Synthesis, structure, property relationships of synthetic polymers. Prerequisite: CH E 361.
- CH E 466. Fuel Cell and Hydrogen Technology 3 cr.
 Introduction to fundamentals and applications. Includes the thermodynamics; electrochemical kinetics and fuel cell electrode catalyst; systems and design and reforming; hydrogen production, storage, and safety; applications of fuel cells in stationary power generation, portable power, and automobiles. Prerequisites: CHEM 111G and PHYS 215G.
- CH E 468. Adsorption 3 cr.
 Introductory course includes adsorption equilibrium and kinetics theories; materials and characterization; processes and design. Selected applications of adsorption processes in chemical, pharmaceutical and environmental industries. Prerequisites: CH E 301 and CH E 306. Restricted to majors.

- CH E 470. Introduction to Nuclear Energy 3 cr.
 Atomic and nuclear structure, nuclear stability and radioactivity, nuclear reactions, detection and measurement of radiation, interaction of radiation with matter, radiation doses and hazard assessment, principles of nuclear reactors, and applications of nuclear technology. Prerequisite(s): CHEM 111.
- CH E 471. Health Physics 3 cr.
 Introduction to Radiation Protection, Radiation/Radioactivity, Radioactive Decay/Fission, Interaction of Radiation and Matter, Biological Effects of Radiation, Radiation Measurement/Statistics, Sampling for Radiation Protection Purposes, Radiation Dosimetry, Environmental Transport, Radiation Protection Guidance, External Radiation Protection, Internal Radiation Protection, Waste Management, and Hazards Analysis and Control. Same as WERC 471. Prerequisites: MATH 191G, CHEM 111G.
- CH E 473. Nuclear Regulations and Compliance Practices 3 cr.
 Introduction, through the use of case studies, to the best technical compliance practices for regulations governing the siting, licensing, constructing, operating and decommissioning of nuclear fuel cycle facilities. Consent of instructor required. Prerequisite(s): MATH 191G and (CHEM 111G or Chem 115). Crosslisted with: WERC 473
- CH E 474. Power Plant Design 3 cr.
 Principles of electric power generation. Review of combustion, heat transfer, and thermodynamic power cycles. Analysis of hydroelectric, fossil fuel, nuclear, and alternative power systems. Environmental and economic considerations. Prerequisite(s): MATH 191G, CHEM 111G.
- CH E 475. Nuclear Reactor Theory 3 cr.
 An overview of the properties of nuclei, nuclear structure, radioactivity, nuclear reactions, fission, resonance reactions, moderation of neutrons, will be followed by mathematical treatment of the neutronics behavior of fission reactors, primarily from a theoretical, one-speed perspective. Criticality, fission product poisoning, reactivity control, reactor stability and introductory concepts in fuel management, slowing down and one-speed diffusion theory. Corequisites: MATH 392. Prerequisites: CHEM 112G, PHYS 215G, MATH 291G.
- CH E 476. Nuclear Fuel Cycles 3 cr.
 Physical and chemical processes in the conventional nuclear fuel cycle: uranium mining and milling, conversion, enrichment, fuel fabrication, reactor operations, interim storage, reprocessing and recycling, waste treatment and disposal. Alternative fuel cycles and future prospects. Prerequisite(s): CH E 470.
- CH E 477. Introduction to Bioengineering 3 cr.
 Introductory course includes both biomedical and biochemical engineering topics; tissue engineering, biomedical systems, artificial organs, biology from an engineering viewpoint, engineering principles of bioprocesses, biochemical engineering, physiologic systems modeling and introduction to applications for recombinant DNA technology. Prerequisites: CHE 201.
- CH E 490. Senior Seminar 1 cr.
 Orientation to professional practice. Oral presentations by invited speakers, faculty, and students. Prerequisite: senior standing. Restricted to majors.
- CH E 491. Special Topics 1-4 cr.
 Lecture and/or laboratory instruction on special topics in chemical engineering. May be repeated to a maximum of 6 credits under different subtitles listed in the Schedule of Classes. Restricted to majors.
- CH E 498. Undergraduate Research 1-3 cr. (6+9P)
 Provides an opportunity for undergraduate students to work in research or areas of special interest such as design problems and economic studies under the direction of a faculty member. Written report and oral presentation in CH E 490, Senior Seminar, covering work required. Prerequisite: consent of instructor and department head. Approval of written application. Maximum of 3 credits per semester. May be repeated for a maximum of 6 credits.
- CH E 501. Intermediate Thermodynamics for Chemical Engineers 3 cr.
 Advanced applications of the first and second law to chemical process systems. The calculus of thermodynamics, equilibrium and stability criteria. Properties relationships for real fluids, both pure materials and mixtures. An introduction to molecular thermodynamics and statistical mechanics. Chemical Engineering graduate students must make B or better.
- CH E 506. Intermediate Transport Phenomena (s) 3 cr.
 Covers the analysis of simultaneous momentum, energy, and mass transport. Development of integral and local balance equations in vector-tensor form. Application of vector-tensor analysis to transport equations. Boundary layer theory and turbulence. Chemical engineering graduate majors must make B or better.
- CH E 513. Intermediate Chemical Engineering Data Analysis (s) 3 cr.
 Intermediate topics in the design and analysis of typical chemical engineering experiments. Topics covered include: linear models, constrained

experimental space, non-linear models, model discrimination, and response surface methodologies. Consent of instructor required.

- CH E 514. Intermediate Chemical Engineering Calculations (f) 3 cr.
Application of analytical mathematical methods to the solution of chemical engineering problems. Includes application of linear analysis, advanced statistics, and integral transforms to chemical engineering systems. Chemical engineering graduate majors must make B or better.
- CH E 516. Numerical Methods in Chemical Engineering 3 cr.
Survey of numerical methods for solving problems commonly encountered in heat and mass transfer, fluid mechanics, and chemical reaction engineering.
- CH E 530. Environmental Management Seminar I 1 cr.
Survey of practical and new developments in hazardous and radioactive waste management provided through a series of guest lectures and reports of ongoing research.
- CH E 539. Intermediate Environmental Modeling 3 cr.
Same as CH E 436 with differentiated assignments for graduate students. Prerequisite(s): MATH 392 or CH E 201.
- CH E 541. Chemical Kinetics and Reactor Engineering (s) 3 cr.
Same as CH E 441 with differentiated assignments for graduate students. Prerequisite: Consent of Instructor
- CH E 542. Intermediate Reactor Analysis and Design (s) 3 cr.
Application and analysis of equations of continuity to multicomponent reaction systems. Introduction to homogeneous and heterogeneous catalysis, single-phase combustion, and shock reaction systems. Chemical engineering majors must earn B or better.
- CH E 566. Fuel Cell and Hydrogen Technology 3 cr.
Same as CH E 466 with differentiated assignments for graduate students.
- CH E 568. Intermediate Adsorption 3 cr.
Same as CH E 468, with differentiated assignments for graduate students.
- CH E 577. Intermediate Biochemical Engineering 3 cr.
Introductory course includes both biomedical and biochemical engineering topics; tissue engineering, biomedical systems, artificial organs, biology from an engineering viewpoint, engineering principles of bioprocesses, biochemical engineering, physiologic systems modeling and introduction to applications for recombinant DNA technology. Taught with CH E 477 with differentiated assignments for graduate students.
- CH E 590. Graduate Seminar 1 cr.
Presentations on topics of professional interest in chemical engineering. Includes seminars by faculty, graduate students, and invited speakers from academia, government, and industry. Required each semester for every M.S. student. All graduate degree candidates required to give seminar. May be repeated for a total of 6 credits. Restricted to majors.
- CH E 592. Intermediate Selected Topics 1-4 cr.
Lecture and/or laboratory instruction on selected topics of current research interest. Subtitled in the Schedule of Classes. Prerequisites: consent of instructor and department head. May be repeated for a total of 6 credits. Restricted to majors.
- CH E 598. Special Research Programs 1-3 cr.
Individual investigations either analytical or experimental. May be repeated for a maximum of 6 credits.
- CH E 599. Master's Thesis 0-88 cr.
Thesis.
- CH E 621. Advanced Topics in Unit Operations, Equipment Design, and Operation 3 cr.
Selected topics of current interest in analysis of unit operations, equipment design and operation, and/or closely related areas. May be subtitled in the Schedule of Classes. Prerequisite: consent of instructor.
- CH E 690. Graduate Seminar 1 cr.
Presentations on topics of professional interest in chemical engineering. Includes seminars by faculty, graduate students, and invited speakers from academia, government, and industry. Required each semester for every Ph.D. student. All candidates for graduate degrees required to give seminar. May be repeated for a maximum of 8 credits. Restricted to majors.
- CH E 698. Special Research programs 1-6 cr.
Advanced topics for current research. Course subtitled in the Schedule of Classes. Prerequisite: consent of instructor. May be repeated for a maximum of 6 credits under different subtitles.
- CH E 700. Doctoral Dissertation 0-88 cr.
Individual research in selected topics of current interest in chemical engineering. Prerequisite: must be doctoral student or have consent of department head.

CIVIL ENGINEERING

Department website: <http://cagesun.nmsu.edu/>
(575) 646-3801
athanson@nmsu.edu

K. R. White, Ph.D. (Texas Tech-emeritus)-structural design ; P. Bandini, Ph.D.(Purdue)-geotechnical engineering; A. S. Bawazir, Ph.D. (New Mexico State)-agricultural/water resources engineering, F. Cadena-C.,* Ph.D. (Cal Tech-emeritus)-environmental engineering; D.Cortes, Ph.D. (Georgia Tech)- geotechnical engineering; A.T. Hanson,* Ph.D. (Iowa State)-environmental engineering; R. L. Idriss, Ph.D. (New Mexico State)-structural engineering; R. B. Jacquez,* Ph.D. (Virginia Polytechnic)-environmental engineering; D. Jáuregui, Ph.D. (Texas-Austin)-structural engineering; J.W. Kang, Ph.D. (Texas-Austin)- structural engineering; N. N. Khandan,* Ph.D. (Drexel)-environmental engineering; J. P. King,* Ph.D. (Colorado State)-agricultural/water resources engineering; C. Newton, Ph.D. (Washington)-structural engineering; L. Papelis, Ph.D. (Stanford); Z. Samani,* Ph.D. (Utah State)-agricultural engineering, water resources; B. Welton, Ph.D. (Notre Dame)structural engineering; C. B. Woodward,* Ph.D. (New Mexico State- emeritus)-structural engineering.*

**Registered Professional Engineer*

Board Certified Environmental Engineer (BCEE)

DEGREE: Master of Science in Civil Engineering

DEGREE: Master of Science in Environmental Engineering

DEGREE: Doctor of Philosophy

MAJOR: Engineering

CONCENTRATION: Civil Engineering

The Civil Engineering Department offers excellent opportunities for advanced study and professional training in several fields leading to the M.S.C.E., M.S. ENVE, and the Ph.D. degrees. Among the currently active areas are environmental (water and wastewater treatment, hazardous waste, and site remediation); geotechnical (experimental soil mechanics, foundations, and other geosystems, and pavement geotechnics); water resources (surface and ground water, irrigation and drainage, erosion and sediment transport); hydraulics (open channel and structures); structural mechanics (emphasis on bridge design and inspection); structural design, and structural health monitoring/NDE.

The department has excellent facilities including some 15 teaching and/or research laboratories with facilities for mechanical, chemical, and biological research. The outstanding feature of the program is the energetic, highly motivated faculty and the low student-faculty ratio. The department currently has several ongoing research projects of various size and scope employing graduate students. Office space is normally provided for those students pursuing an advanced degree. Teaching and research assistantships are available to qualified students.

Students enrolling for graduate work in civil engineering must have received a bachelor's degree in engineering or one of the allied fields. A candidate for the master's degree may choose either a thesis or a nonthesis option. When a student enrolls for the Ph.D., a doctoral committee is formed to assist the student in planning a program appropriate to the student's background and goals and to administer the required examinations. All Ph.D. candidates in civil engineering must have a demonstrated proficiency in English and two research tools. Mutual understanding between the Ph.D. candidate and his or her doctoral committee on the final nature of these two research tools will be on an individual basis.

Exceptions to these requirements must be approved by the head of the department.

STRUCTURAL ENGINEERING

Thesis Option

Prerequisite Courses:

C E 365, Indeterminate Structural Analysis

C E 444, Structural Steel Design (based on AISC)

C E 445, Reinforced Concrete Design (based on ACI)

Required Courses:

C E 501, Advanced Mechanics of Materials	3
C E 515, Finite Element Methods.....	3
C E 544, Advanced Design of Steel Structures.....	3
C E 545, Advanced Concrete Design.....	3
C E 571, Structural Dynamics	3

Option Courses:

At least 9 credits from the following list (1):

C E 502, Advanced Mechanics of Steel Structures.....	3
C E 504, Advanced Engineering Design.....	3
C E 509, Deep Foundations.....	3
C E 543, Advances in Concrete Technology.....	3
C E 547, Bridge Engineering.....	3
C E 548, Advanced Wood and Masonry Design.....	3
C E 554, Wood Design	3
C E 555, Masonry Design	3
C E 572, Earthquake Engineering.....	3
C E 577, Pavement Analysis and Design	3
C E 615, Advanced Finite Element Analysis	3
C E 645, Prestressed Concrete Analysis and Design	3

Research Credits:

C E 599, Master's Thesis	6
(A maximum of 6 credits are counted toward the Master's Degree program)	
Total credits: 24 credits of coursework and 6 credits of Master's Thesis research.	

GEOTECHNICAL ENGINEERING

Thesis Option

Prerequisite Courses:

- One course in Geological Sciences: GEOL 111 or higher
- One course in Reinforced Concrete (based on ACI): C E 445 or higher
- C E 357, Soil Mechanics (with lab)
- C E 457, Foundations Design

Required Courses:

C E 506, Advanced Soil Mechanics	3
C E 509, Deep Foundations.....	3
C E 585, Slope Stability Analysis and Design.....	3

Optional Courses:

- (Can be taken as C E 503. A maximum of 6 credits of C E 503 are counted toward the Masters Degree program)
- At least 6 credits from the following list:
- | | |
|---|---|
| C E 485, Design of Earth Dams | 3 |
| C E 577, Ground Improvement..... | 3 |
| G EN 452, Geohydrology or C E 581, Ground Water Hydrology | 3 |
- At least 6 credits from the following list:
- | | |
|---|---|
| C E 515, Finite Element Methods (or similar course) | 3 |
| C E 575, Plasticity Theory..... | 3 |
| C E 577/ 479, Pavement Analysis and Design..... | 3 |
| C E 586, Geotechnical Earthquake Engineering | 3 |
- At least 3 credits from courses outside the area or department (1):
- | | |
|--|---|
| Geological Sciences or Geophysics course (For example: GEOL 470, GPHY 451) | 3 |
| A ST 505, Statistical Inference I or similar statistics course..... | 3 |
| C E 543, Advances in Concrete Technology..... | 3 |
| C E 545, Advanced Concrete Design..... | 3 |
| C E 596/503, Special Design Program | 3 |
| ENVE 455, Solid and Hazardous Waste System Design | 3 |
| Course in mathematics, numerical methods, or programming (450 or higher).... | 3 |

Research Credits:

C E 599, Master's Thesis (A maximum of 6 credits are counted toward the Masters Degree program).....	6
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Total credits: 24 credits of coursework and 6 credits of Master's Thesis research (2) (3)

Notes:

- (1) The optional courses outside the area or department should be previously approved by the academic advisor or student's Graduate Committee.
- (2) International students must be registered at least 9 credits per semester.
- (3) International students may be required to take English language courses to show proficiency in English.

WATER RESOURCES ENGINEERING

Thesis Option

Prerequisite Courses: (Total of 30 credits required)

Core Courses.....	12
Statistics.....	3
Area of Interest Courses	9
Thesis (C E 599, Master's Thesis).....	6

Non-Thesis Option (Total of 30 credits required):

Core Courses.....	12
Statistics.....	3
Area of Interest Courses	15

Foundation Requirements

- 1. ABET- Accredited B.S. in Civil, Agricultural, Geological Engineering, or closely related field or equivalent (as per existing CAGE Department regulations)
- 2. One course in surface water hydrology
- 3. One course in hydrogeology or geohydrology
- 4. At least three semesters of hydraulic and hydraulic design

Core Courses (15 credits from following courses):

A ST 505, Statistical Inference I or advanced statistics class if student is qualified	
C E 531, Open Channel Hydraulics.....	3
C E 557, Water Resources Development	3
C E 581, Groundwater Hydrology and Modeling	3
C E 582, Statistical Hydrology	3

Area of Interest Courses (Flexible):

Agricultural/ Civil/ Environmental Engineering

- A EN 459, Design of Water Wells/ Pumping Systems
- A EN 475, Soil and Water Conservation Engineering
- A EN 478, Irrigation and Drainage Engineering
- A EN 479, Irrigations System Design and Management
- C E 482, Hydraulic Structures
- C E 483/503, Surface Water Hydrology
- C E 485/504, Design of Small Earth Dams
- C E 682, Hydrodynamics II
- ENVE 557, Surface Water Quality Modeling Control
- ENVE 630, Fate and Transportation of Environmental Contaminants
- G EN 452/C E 503, Geohydrology
- GEOG 487, GIS Practicum
- GEOG 581, GIS Modeling and System Modeling
- SOIL 651, Advanced Soil Chemistry
- SOIL 652, Advanced Soil Physics

Modeling/Fluid Mechanics

- M E 530, Intermediate Fluid Mechanics
- M E 533, Computational and Theoretical Fluid Mechanics
- M E 580, Engineering Analysis II- Numerical Methods

Management/ Optimization

- I E 533, Linear Programming
- I E 534, Nonlinear Programming
- I E 535, Discrete Optimization

Institutional Aspects:

AG E 484, Water Resources Economics

BLAW 527, Negotiation and Dispute Resolution

C E 486/487/488, Water Law, Water Regulations, Etc.

ECON 583, Cost-Benefit Analysis

Approved Electives in College of Engineering: A ST, AEEC, GEOG, GEOL, MATH, STAT, and SOIL (Must be approved by the Advisor and Committee Members).

DEGREE: Master of Science in Environmental Engineering

Environmental engineering at New Mexico State University provides unique educational and research opportunities at the graduate level in the fields of water quality, water treatment, water pollution control, wastewater treatment reclamation and reuse, industrial, hazardous and solid waste management, groundwater treatment, air pollution control; waste minimization and pollution prevention. Therefore, course offerings have been developed to emphasize basic engineering and scientific principles, as well as design and application of environmental engineering unit operations and processes. Special problem and thesis research are closely matched with faculty expertise and the programs and professional goals of the graduate students. Study and research programs are specifically designed for individual students, taking advantage of not only the program capabilities, but complementing activities of the university as a whole, the student's professional experience and work environment.

Graduate students satisfy degree requirements in environmental engineering by completing specific core course work. Course work in the graduate program includes: water and wastewater treatment, solid and hazardous waste systems design, environmental chemistry, environmental microbiology, environmental contaminant analysis, industrial pollution control, fate and transport of pollutants in engineered and natural systems and water quality in surface water and groundwater systems. Additional topics of interest to the students are covered through special topics classes and by courses taught outside of the College of Engineering.

The M.S. program requires either a thesis or a non-thesis practice oriented experience. The non-thesis option is designed for students that are working full time in engineering practice, but is also available to other students interested in pursuing a non-thesis option. The thesis option consists of a minimum of 30 semester credit hours, including 6 credit hours of thesis. Students who are working full time in engineering practice may apply for the non-thesis option. This option consists of 30 semester credit hours of which up to 3 credit hours can be awarded for a professional engineering design experience (ENVE 590) and up to 6 credit hours can be awarded for an engineering practicum (ENVE 598). Transfer credit for courses taken elsewhere is evaluated on an individual basis. Up to six semester hours of graduate level courses taken may be used to satisfy M.S. degree requirements provided that the credits were not used toward another degree.

REQUIRED CURRICULUM

The graduate environmental engineering program of the CAGE department expects all M.S. and Ph.D. students to meet certain requirements in pursuit of an advanced degree. Some of these requirements are related to the quantity, level, and quality of coursework. This Graduate Catalog details what is expected as a minimum for graduation, but it is up to the student and his/her advisor and graduate committee to determine the plan of study for the student. The student and his/her advisor will create this program of study in the first semester of graduate work.

Students desiring to work toward an advanced degree in environmental engineering must have completed undergraduate preparation similar to that required for a Bachelor of Science degree in an ABET accredited engineering program or must have adequate background, as determined by the graduate faculty of the program. The program administrator will approve exceptions to these requirements.

The environmental engineering faculty will form a committee for every entering student. The faculty will evaluate the student's record and determine which deficiencies and/or core courses, if any, are needed by the student. For all professional non-thesis programs, the department head will review the committee's decision. In order to provide consistency among plans of study for graduate students and to set a minimum set of core or pertinent courses, it is the policy of the graduate environmental engineering program that each graduate student will fulfill the following course requirements (or equivalent).

Required Background Courses

The following courses may be required if the student did not take a similar course at the undergraduate level, as negotiated with the general faculty committee.

C E 356, Fundamentals of Environmental Engineering.....	3
C E 382 Hydraulic Systems Design	3
ENVE 455, Solid and Hazardous Waste Systems Design	3
ENVE 456, Environmental Engineering Design	3

Core Courses- All of the following core courses are required (12 cr.):

ENVE 551, Unit Processes/Operation of Water Treatment	3
ENVE 552, Unit Processes/Operations of Wastewater Treatment	3
ENVE 553, Chemical Theories of Environmental Engineering	3
ENVE 557, Surface Water Quality Modeling	3

Thesis or Professional Experience for MS students

ENVE 590, Professional Engineering Experience 3 (may replace ENVE 455 or 456) and ENVE 598, Environmental Engineering Practicum 6, or ENVE 599, Master's Thesis (for students pursuing the thesis option) 6

Dissertation, Research Tools for Ph.D. Students

A minimum of two research tools	3 cr. each.
ENVE 700, Doctoral Dissertation	18 cr.

Professional Development Electives for the Non-thesis option (outside the college of engineering):

M.S. program: A minimum of six credits hours in graduate-level communications, management, economics and/or other relevant disciplines. These courses will be selected by the student and must be approved by the environmental engineering faculty (6 cr.).

Elective Courses (3 cr.)

A EN 459, Design of Water Wells/Pumping Systems.....	3
C E 557, Water Resources Development	3
E S 462, Sampling and Analysis of Environmental Contaminants.....	3
ENVE 510, Environmental Engineering Seminar	1-3
ENVE 554, Microbiological Theories of Environmental Engineering	3
ENVE 558, Advanced Waste Management.....	3
ENVE 630, Fate and Transport of Environmental Contaminants	3
G EN 452, Geohydrology	3

AGRICULTURAL ENGINEERING

A EN 459. Design of Water Wells/Pumping Systems	3 cr.
Design of water wells; selection and specification of pumps and power units. Prerequisite: C E 382.	
A EN 475. Soil and Water Conservation	3 cr.
Types and extent of erosion. Design and operation of structural and vegetative systems to control erosion. Elements of hydrology. Prerequisite: C E 331. Corequisite: C E 382 or consent of instructor.	
A EN 478. Irrigation and Drainage Engineering	3 cr. (2+3P)
Design and operation of surface and sprinkler irrigation systems; pumping and conveyances; introduction to principles and practices of drainage systems and wells. Prerequisite: C E 382 or consent of instructor.	
A EN 498. Special Topics	1-3 cr.
Prerequisite: consent of instructor. May be repeated for a maximum of 6 credits.	

CIVIL ENGINEERING

C E 450. Engineering Economy and Law	3 cr.
Discounted cash flows, economics of engineering projects, contracts and specifications. Prerequisite: senior standing.	
C E 450 H. Engineering Economics Honors	3 cr.
Discounted cash flows, economics of engineering projects, contracts, and specifications. Prerequisite: senior standing and the University Honors Program.	
C E 452. Geohydrology	3 cr.
Origin, occurrence, and movement of fluids in porous media and assessment of aquifer characteristics. Development and conservation of ground water resources, design of well fields. Prerequisite(s): C E 160 or GEOL 111G, and C E 231. Crosslisted with: E S 452 and GEOL 452.	

- C E 454. Wood Design** 3 cr.
Theory and design of wood structural members and systems subjected to gravity and lateral loads. Taught every other year, alternates with CE 455, Masonry Design. Prerequisites: C E 301 and C E 315. Corequisites: C E 311 and C E 365.
- C E 455. Masonry Design** 3 cr.
Theory and design of masonry structural members and systems subjected to gravity and lateral loads. Taught every other year, alternates with C E 454, Wood Design. Prerequisites: C E 301 and C E 315. Corequisites: C E 311 and C E 365.
- C E 457. Foundation Design** 3 cr. (2+3P)
Application of principles of classical soil mechanics to the design and analysis of shallow and deep foundations and retaining structures. Prerequisite(s): C E 357.
- C E 459. Geomechanics and Rock Engineering** 3 cr. (2+3P)
Application of rock mechanics principles to the design and construction of structures in and on rock, including design of rock support systems, rock slopes and blasting/excavation techniques. Prerequisite(s): C E 357. Pre/Corequisite(s): C E 457.
- C E 468. Mechanics of Structural Systems** 3 cr. (2+3P)
Selected topics from intermediate mechanics of materials and structures. Elastic and inelastic analysis of structural systems and components. Response of structures to seismic forces. Application of Mathcad to structural engineering problems. Prerequisite: C E 301 and C E 315. Corequisite: C E 365.
- C E 469. Structural Systems** 3 cr. (2+3P)
Design of structural systems for building and bridges. Prerequisite: C E 444. Corequisite: C E 445.
- C E 470. Design of Municipal and Hazardous Waste Landfills** 3 cr.
Solid waste and application of geotechnical engineering principles and methods to the site selection and design of municipal and hazardous waste landfills. Prerequisite(s): C E 357 and C E 452, or consent of instructor.
- C E 471. Highway Engineering** 3 cr. (2+3P)
Highway systems design and management. Prerequisite: C E 357, STAT 371, or consent of instructor.
- C E 477. Construction Engineering** 3 cr.
Construction planning, equipment, and methods. Prerequisites: C E 357 and C E 450.
- C E 479. Pavement Analysis and Design** 3 cr.
Covers stresses and deflections in pavement layers, material characterization, flexible and rigid pavement design by AASHTO, mechanistic design, rehabilitation concepts. Taught with C E 577. Extra work required for graduate credit. Prerequisite(s): C E 357.
- C E 482. Hydraulic Structures** 3 cr.
Engineering design of water-regulating structures. Prerequisites: C E 301 and C E 382.
- C E 483. Surface Water Hydrology** 3 cr.
Hydrologic cycle and relationships between rainfall and surface water runoff. Prerequisite: C E 331 or consent of instructor.
- C E 485. Design of Earth Dams** 3 cr.
Engineering design applied to site selection, foundation inspection and treatment, hydrology and hydraulics, stability, and seepage analysis. Economic and environmental factors. Prerequisite(s): C E 357.
- C E 497. Senior Seminar** 2 cr.
Selected topics on the civil engineering profession and orientation for professional practice. Preparation for the FE exam. Corequisite: application for degree.
- C E 498. Special Topics** 1-3 cr.
Prerequisite: consent of department head. May be repeated for a maximum of 9 credits.
- C E 501. Advanced Mechanics of Materials** 3 cr.
Study of stress and strain in two and three dimensions, theories of failure, stress concentrations, unsymmetrical bending, curved beams, beams on elastic foundations, column theories, torsion, thick-wall cylinders. Prerequisites: C E 301, MATH 392. Same as M E 501.
- C E 502. Advanced Mechanics of Steel Structures** 3 cr.
Advanced structural mechanics applicable to steel structures. Includes inelastic behavior, plastic analysis, column and frame stability and torsion. Prerequisite: C E 444.
- C E 503. Special Design and Analysis Program** 3-6 cr.
Design and analysis covering subject matter of an approved 450 undergraduate departmental course plus an additional report or project. Course may be subtitled in the Schedule of Classes. Prerequisite: consent of instructor/committee. May be repeated once for a total of 6 credits.
- C E 504. Advanced Engineering Design** 3 cr.
Advanced engineering design covering subject matter of a selected capstone undergraduate design course plus an additional report or project. May be subtitled. Prerequisite: consent of instructor/committee.
- C E 506. Advanced Soil Mechanics** 3 cr.
Stress and strain analyses in soil, stress paths; drained and undrained shear strengths of granular soils and clays, consolidation, liquefaction, soil improvement. Prerequisite: C E 457 or consent of instructor.
- C E 507. Design of Earth Retaining Structures** 3 cr.
Lateral earth pressure theory, soil-reinforcement interaction, and analysis and design of rigid and flexible earth retaining structures for support of fills and excavations, including retaining walls, mechanically stabilized earth (MSE) walls, sheet pile walls, anchored walls, tiebacks and soil nailing. Prerequisite(s): C E 357. Pre/Corequisite(s): C E 457.
- C E 508. Soil Dynamics** 3 cr.
Theory of vibration, stress wave propagation in soils, dynamic stress, deformation and strength characteristics of soils, dynamic bearing capacity and earth pressure problems, machine foundations, liquefaction of soils. Background: MATH 392, C E 457.
- C E 509. Deep Foundations** 3 cr.
Behavior, analysis and design of pile and pier foundations subjected to axial and lateral loads. Prerequisite: C E 457 or consent of instructor.
- C E 515. Finite Element Methods** 3 cr.
Introduces the finite element method. Topics may include beam, frame, plane stress, plane strain, axisymmetric, and 3-D stress elements. Includes static and dynamic analysis. Uses readily available finite-element software. Prerequisite: graduate standing or consent of instructor.
- C E 523. Advanced Engineering Economy** 3 cr.
Same as I E 523.
- C E 525. Advanced Analysis of Engineering Systems** 3 cr.
Development of engineering systems requiring advanced analytical solutions. Solutions to equations arising from engineering problems selected from the following topics: groundwater flow, beams and plates, electrical potential, heat transfer, structural dynamics, structural stability, solute transport problems, diffusion problems, and others.
- C E 530. Environmental Management Seminar I** 1 cr.
Survey of practical and new developments in hazardous and radioactive waste management provided through a series of guest lectures and reports of ongoing research.
- C E 531. Open Channel Hydraulics** 3 cr.
Theoretical and applied hydraulics of open channels, with emphasis on nonuniform flow, rapidly varied flow, and wave formation. Prerequisite: C E 382 or consent of instructor.
- C E 543. Advances in Concrete Technology** 3 cr.
Advanced topics related to concrete materials, including mixture proportioning with nontraditional admixtures, roles and side effects of concrete admixtures, durability of concrete, nondestructive testing of concrete, creep, and shrinkage. Prerequisites: C E 311 and C E 445.
- C E 544. Advanced Design of Steel Structures** 3 cr.
Connection design; beam, column, and beam-column stability and design; and seismic frame design. Prerequisites: C E 444 and C E 468.
- C E 545. Advanced Concrete Design** 3 cr.
Prestressed concrete, ultimate strength theory, design of shell structures. Prerequisites: C E 445 and C E 468.
- C E 546. Advanced Structural Design** 1-9 cr.
Selected topics in design from the following: wood, seismic, reinforced masonry, structural composites, bridges, buildings. Prerequisite: C E 469 or consent of instructor. May be repeated for a maximum of 9 credits with instructor's approval.
- C E 547. Bridge Engineering** 3 cr.
Topics related to prestressed concrete, reinforced concrete and steel bridge design according to the AASHTO specifications; bridge analysis and evaluation. Prerequisite: C E 469 or consent of instructor. May be repeated for a maximum of 6 credits.
- C E 548. Advanced Wood and Masonry Design** 3 cr.
Advanced design of wood and masonry structures and components. Prerequisite: C E 443 or consent of instructor.
- C E 550. Environmental Management Seminar II** 1 cr.
Survey of practical and new developments in hazardous and radioactive waste management provided through a series of guest lectures and reports of ongoing research.
- C E 554. Wood Design** 3 cr.
Theory and design of wood structural members and systems subjected to gravity and lateral loads. Design project required. Taught every other year, alternates with C E 555 - Masonry Design.

- C E 555. Masonry Design** 3 cr.
Theory and design of masonry structural members and systems subject to gravity and lateral loads. Design project required. Taught every other year, alternates with C E 554 - Wood Design.
- C E 557. Water Resources Development** 3 cr.
Students function as members of a consulting panel and prepare reports on major water resources development problems. Political, financial, and social aspects of water resources development are considered as well as scientific and technical details. Background: C E 450. Corequisite: C E 483, or C E 482.
- C E 567. Elastic Stability** 3 cr.
Buckling of members subjected to axial and transverse loadings. Lateral buckling of beams; buckling of plates and shells; columns; energy methods; elastic buckling deflections. Application to practical problems. Prerequisite: MATH 392, preferably MATH 472. Same as M E 567 C E 569.
- C E 569. Theory of Plates and Shells** 3 cr.
Analysis of thin plates and shells under transverse loads. Classical, numerical and approximate methods. Prerequisites: C E 501, MATH 472.
- C E 571. Structural Dynamics** 3 cr.
Response of elastic structure to dynamic loading. Moving load, earthquake and blast loading. Prerequisite: C E 468 or consent of instructor.
- C E 572. Earthquake Engineering** 3 cr.
Earthquake characteristics; seismic loads; elastic and inelastic response; analysis and design of buildings for earthquakes. Prerequisites: graduate standing and consent of instructor.
- C E 575. Plasticity Theory** 3 cr.
Introduce the basic theory of plasticity and its applications in design and modeling of engineering materials. Prerequisite: CE 301
- C E 576. Continuum Mechanics** 3 cr.
An introduction to the main principles of continuum mechanics: the stress tensor, deformation, and flow, constitutive relations, and applications to common solids and fluids. Prerequisite: CE 301.
- C E 577. Pavement Analysis and Design** 3 cr.
Covers stresses and deflections in pavement layers, material characterization, flexible and rigid pavement design by AASHTO, mechanistic design, rehabilitation concepts. Prerequisite(s): C E 357 or consent of instructor.
- C E 579. Ground Improvement** 3 cr.
Review soil properties and the need for ground improvement, introduce different kinds of ground improvement techniques. Prerequisites: CE 357.
- C E 581. Ground Water Hydrology** 3 cr.
Mathematical treatment of water flow in porous media. Emphasis on hydraulics of water movement, including pumping and recharge wells, drainage, and water quality. Prerequisites: MATH 392, G EN 452, and C E 382, or consent of instructor.
- C E 582. Statistical Hydrology** 3 cr.
Application of statistical techniques to hydrologic data, including distributions, hypothesis testing, linear models, non-parametrics, and time-series and stochastic models. Background: C E 510, E ST 465, or consent of instructor.
- C E 585. Slope Stability Analysis and Design** 3 cr.
Design of earth slopes, causes of instability, limit equilibrium methods, slope reinforcement (geosynthetics soil nailing, tiebacks), seismic analysis, rock slope stability. Consent of instructor required.
- C E 586. Geotechnical Earthquake Engineering** 3 cr.
Earthquake origin and geology, wave propagation, dynamic soil properties, ground response analysis, local site effects, design ground motion, liquefaction assessment. Prerequisite: consent of instructor.
- C E 596. Special Topics** 1-3 cr.
May be repeated for a maximum of 6 credits. Prerequisite: consent of department head.
- C E 597. Problems in University Instruction** 1-2 cr.
For description see G S 597 under Graduate School. Graded S/U.
- C E 598. Special Research Programs** 1-3 cr.
Individual investigations either analytical or experimental. May be subtitled. Maximum of 3 credits per semester.
- C E 599. Master's Thesis** 0-88 cr.
Thesis.
- C E 600. Doctoral Research** 1-88 cr.
Research.
- C E 601. Topics in Mechanics of Materials I** 3 cr.
Selected topics from the following: theories of failure with application to experimental results; theory of large deflections; study of elastic-plastic behavior in mechanics of materials; considerations in advanced elasticity; elastoplastic instability; impact and repeated loading; advanced photoelasticity; membrane stress theory.
- C E 602. Topics in Mechanics of Materials II** 3 cr.
Selected topics from the following: theories of failure with application to experimental results; theory of large deflections; study of elastic-plastic behavior in mechanics of materials; considerations in advanced elasticity; elastoplastic instability; impact and repeated loading; advanced photoelasticity; membrane stress theory.
- C E 604. Advanced Engineering Topics** 3 cr.
In depth study of a topic at the forefront of environmental engineering & science. Journal papers will be critically reviewed and students will be asked to write an analysis of the topic and present their thoughts orally.
- C E 611. Topics in Properties of Materials I** 3 cr.
Selected topics from the following: finite strains; theories of the mechanism of flow and fracture; theory of dislocations; creep; viscosity; viscoelastic behavior; yield conditions; theory of the ideally plastic body; plastic flow; effect of temperature and other environmental conditions.
- C E 612. Topics in Properties of Materials II** 3 cr.
Selected topics from the following: theories of failure with application to experimental results; theory of dislocations; creep; viscosity; viscoelastic behavior; yield conditions; theory of the ideally plastic body; plastic flow; effect of temperature and other environmental conditions.
- C E 615. Advanced Finite Element Methods** 3 cr.
Finite element method with emphasis on stress analysis. May include development and use of plane stress, plane strain, and 3-D and shell elements. Includes static, dynamic, and nonlinear analysis. Prerequisite: graduate standing.
- C E 641. Topics in Structural Mechanics I** 3 cr.
Selected topics from the following: suspension bridges, folded plates, thin shells and domes, semi-rigid structures, three dimensional structures, movable bridges; relaxation and iteration methods, structural dynamics; special beams; model analysis of structures.
- C E 642. Topics in Structural Mechanics II** 3 cr.
Selected topics from the following: suspension bridges, folded plates, thin shells and domes, semi-rigid structures, three dimensional structures, movable bridges; relaxation and iteration methods, structural dynamics; special beams; model analysis of structures.
- C E 644. Advanced Plastic Structural Analysis and Design** 3 cr.
Plastic analysis and design of steel and/or concrete structures. Analysis and design for high seismic forces. Prerequisites: C E 444, C E 467, and C E 469. Corequisite: C E 501 or consent of instructor. May be repeated for a maximum of 6 credits.
- C E 645. Prestressed Concrete** 3 cr.
Behavior of prestressed concrete; design of statically determinate and indeterminate structures; estimation of prestress loss; flexure and shear strength; deflections and stress control; composite behavior and design. Prerequisites: graduate standing and consent of instructor.
- C E 681. Topics in Hydrodynamics I** 3 cr.
Selected topics from the following: ideal and real fluids flow; laminar/turbulent flow; boundary layer; stream function and conformal mapping; hydraulic transients; characteristics of wave phenomena; method of characteristics. Prerequisite: consent of instructor. May be repeated for a maximum of 6 credits.
- C E 682. Topics in Hydrodynamics II** 3 cr.
Selected topics in flow-in open channels, flow-through porous media, and transport of sediments and contaminants. Prerequisite: consent of instructor. May be repeated for a maximum of 6 credits.
- C E 698. Special Research Programs** 1-3 cr.
May be subtitled. May be repeated for a maximum of 9 credits.
- C E 700. Doctoral Dissertation** 0-88 cr.
Dissertation.

ENVIRONMENTAL ENGINEERING

- ENVE 455. Solid and Hazardous Waste Systems Design** 3 cr.
Design of processes and facilities used in the transport, storage, treatment, and disposal of solid and hazardous wastes. Prerequisite: C E 356 or consent of instructor.
- ENVE 456. Environmental Engineering Design** 3 cr. (2+3P)
Design of chemical, physical and biological operations and processes involved in water and wastewater treatment. Prerequisite: C E 356.
- ENVE 462. Sampling and Analysis of Environmental Contaminants** 3 cr. (1+6P)
Theory, application, methodology, and instrumentation used in the sampling and analysis of environmental contaminants. Prerequisites: C E 256 and E S 256. Same as E S 462.
- ENVE 487. Air Pollution Control Systems Design** 3 cr.
An introduction to sources and nature of air pollution, regulations, and risk analysis. Detailed study of air pollution control technologies and design of

air pollution control equipment. Prerequisite: senior or graduate standing. Restricted to C E, CH E, or M E majors.

- ENVE 501. Environmental Education Studies 1-3 cr.
Development of environmental education projects and instructional practices for K-12 teachers and community volunteers. Covers water quality, land issues, pollution prevention, and other topics relevant to environmental management. Instruction provided by a team of faculty, environmental industry professionals, and government employees. Prerequisite: bachelor's degree. May be repeated for a maximum of 6 credits.
- ENVE 503. Special Design and Analysis Program 3-6 cr.
Design and analysis covering subject matter of an approved 450-plus undergraduate departmental course plus an additional report or project. May be subtitled. Prerequisite: consent of instructor/committee. May be repeated once for a total of 6 credits.
- ENVE 504. Advanced Engineering Design 3 cr.
Advanced engineering design covering subject matter of a selected capstone undergraduate design course plus an additional report or project. May be subtitled. Prerequisite: consent of instructor/committee.
- ENVE 510. Environmental Engineering Seminar 1 cr.
Topics in environmental engineering. Prerequisite: consent of instructor. May be repeated for a maximum of 3 credits. Restricted to majors.
- ENVE 551. Unit Processes/Operation of Water Treatment 3 cr.
Theory and applications with unit processes in environmental engineering. Physical / chemical treatment methods emphasized. Prerequisite: consent of instructor. Corequisite: ENVE 551L. Restricted to majors.
- ENVE 551 L. Unit Processes/Operation of Water Treatment Laboratory 1 cr. (3P)
Practical laboratory covering development of design information for common unit operations/process using bench scale and small pilot scale facilities. Prerequisite: consent of instructor. Corequisite: ENVE 551. Restricted to majors.
- ENVE 552. Unit Processes/Operation of Wastewater Treatment 3 cr.
Theory and applications with unit processes in environmental engineering. Biological treatment methods emphasized. Prerequisite: consent of instructor. Corequisite: ENVE 552L. Restricted to majors.
- ENVE 552 L. Unit Processes/Operation of Wastewater Treatment Laboratory 1 cr. (3P)
Dry laboratory emphasizing design of common unit operations/processes in biological treatment. Prerequisite: consent of instructor. Corequisite: ENVE 552. Restricted to majors.
- ENVE 553. Chemical Theories of Environmental Engineering 3 cr.
Theoretical aspects of physical chemistry applied to the solution of environmental engineering problems. Emphasis on carbonate equilibria solubility, buffering and redox conditions. Prerequisite: consent of instructor.
- ENVE 554. Microbiological Theories of Environmental Engineering 3 cr. (2+3P)
The theory and application of microbiology as related to environmental engineering; understanding and controlling the performance of biological unit processes when used in treatment of wastes and wastewaters. Prerequisite: consent of instructor.
- ENVE 557. Surface Water Quality Modeling 3 cr.
Modeling the impacts of waste disposal practices on surface waters. Emphasis on fate and transport of bacteria, dissolved oxygen, nutrients, and toxicants in rivers, lakes, and tidal waters. Restricted to majors.
- ENVE 558. Advanced Waste Management 3 cr.
Advanced unit operations/processes of wastewater treatment; pretreatment requirements, flow equalization, neutralization, precipitation, adsorption, air floatation, air stripping, and nutrient removal. Examples drawn from trade waste. Restricted to majors.
- ENVE 596. Special Research Programs 1-3 cr.
Same as CE 596.
- ENVE 598. Special Research Programs 1-3 cr.
Individual investigations either analytical or experimental. May be repeated for a maximum of 6 credits. Restricted to majors.
- ENVE 599. Master's Thesis 0-88 cr.
Thesis. May be repeated for a maximum of 6 credits.
- ENVE 630. Fate and Transport of Environmental Contaminants 3 cr.
Modeling of transport phenomena in natural and engineered systems for predicting the fate of contaminants in the air, soil, sediment, and water compartments of the ecosystem. Prerequisites: C E 555 and consent of instructor.
- ENVE 631. Topics in Environmental Engineering I 3 cr.
Selected topics in treatment of contaminated soils and groundwaters; advanced water treatment; environmental modeling. Course subtitled in the Schedule of Classes. Prerequisite: consent of instructor. May be repeated for a maximum of 6 credits.

- ENVE 632. Topics in Environmental Engineering II 3 cr.
Selected topics in treatment of industrial and hazardous wastes, advanced wastewater treatment, environmental modeling. Course subtitled in the Schedule of Classes. Prerequisite: consent of instructor. May be repeated for a maximum of 6 credits.

SURVEYING ENGINEERING

- SUR 450. Senior Project 1 cr.
Research project prepared by student. Includes class presentation. Students will learn how to research after the end of their formal education. Prerequisite(s): Senior Standing.
- SUR 451. Advanced Survey Measurements, Analysis, and Adjustments 3 cr. (2+3P)
Rigorous analysis of theory of observations as applied to surveying. Conventional topics of error ellipses, least squares, and survey pre-analysis, etc., to be addressed. Emphasis on computer applications for adjustments and analysis. Prerequisite(s): SUR 330, SUR 351, MATH 280. Pre/Corequisite(s): STAT 371.
- SUR 452. Land Development Design 3 cr. (2+3P)
Covers different phases of land development process. Study of New Mexico subdivision and condominium laws. Site evaluation includes boundary, control topographic surveys, and environmental and cultural considerations. Students design lot and building arrangements and streets. Prerequisite(s): SUR 312, SUR 328.
- SUR 461. Introduction to Satellite Geodesy 3 cr. (2+3P)
Overview of astronomy concepts, summary of celestial mechanics, history of satellite positioning, modern positioning techniques, impact of gravity, review of geodetic standards and specifications, logistics of GPS data collection. GPS data processing, network adjustments, and evaluation of spatial data accuracy. Prerequisites: SUR 361 and MATH 280.
- SUR 464. Land Information Systems Applications 3 cr. (2+3P)
Concepts of real property, land tenure and ethics, and land registration systems; the function and design of multipurpose cadastre and land information systems. Prerequisite(s): SUR 264, SUR 312, and SUR 330.
- SUR 470. Industrial Measurements 3 cr. (2+3P)
Survey measurements and analysis as applied to industrial applications. Topics include deformation studies, optical tooling, etc. Prerequisite: MATH 191G.
- SUR 485. Advanced Photogrammetry 3 cr. (2+3P)
Topics include analytical methods, close-range photogrammetry, photo resection, and softcopy photogrammetry. Prerequisite: SUR 285. SUR 330, and SUR 351.
- SUR 498. Special Topics 1-3 cr.
Directed studies into current topics. Subject to be agreed upon between student and instructor. Prerequisite: Consent of instructor

ELECTRICAL AND COMPUTER ENGINEERING

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DEGREE: Master of Science in Electrical Engineering**DEGREE: Doctor of Philosophy****MAJOR: Engineering****CONCENTRATION: Electrical Engineering****MINOR: Electrical Engineering**

The Klipsch School of Electrical and Computer Engineering offers graduate work leading to the Master of Science and Doctor of Philosophy degrees. Areas of emphasis for masters and doctoral students are digital signal processing, communications, microelectronics/VLSI, control systems, electromagnetics, electro-optics, electric energy systems, and computer engineering. Research in the above areas currently being conducted by the faculty ensures that doctoral candidates will work on the frontier of knowledge in these areas. The graduate programs are intended to provide broad graduate-level training in electrical engineering. In addition, appropriate courses in computer science, industrial engineering, mathematics, physics, and business management may be integrated into a graduate student's program of study.

Students desiring to work toward an advanced degree in electrical engineering must have completed undergraduate preparation substantially equivalent to that required for the Bachelor of Science in Electrical Engineering degree at this institution. For students with undergraduate degrees in other disciplines, see below. For further information on the Klipsch School of Electrical and Computer Engineering, please consult the web page <http://www.ece.nmsu.edu/>.

RESEARCH FACILITIES AND HIGHLIGHTS

There are extensive computer and research facilities available in the Klipsch School of Electrical and Computer Engineering. The school has numerous PC workstations contained within three different open computing labs and several research laboratories. Teaching workstations operate under Windows 7, but have access to Ubuntu (Linux) through VirtualBox. Researchers requiring larger computational resources have access to the departmental 16 processor HP Integrity rx8620 supercomputer (each of the 16 processors consists of a 4 core IA-64 processor), and a 128-processor "Beowulf" distributed memory parallel computer. An SGI Altix 18200CE cluster with a total of 22 compute nodes (2 Quadcore 4.0GHz Xeon processors with 16GB RAM per node), and a total of 15TB of storage is also available for engineering research. The internal network consists of a one Gbit/sec fiber optic backbone with 100 Mbit/sec Ethernet connections to all desktop machines. The Electrical Engineering building is linked to a large number of remote computers on campus via NMSUnet and to computers at other universities and research laboratories via the VBNS and the Internet.

The Center for Telemetry and Telemetering hosts the Manuel Lujan, Jr. Space Tele-Engineering Program and the Frank Carden Chair for Telemetry and Telemetering. Faculty and staff in the Center are involved in education and research programs focusing on telecommunications, communication theory, coding and information theory, wireless networks, digital signal processing, optical and radio frequency communications, and digital image processing. The Center has several major research sponsors including NASA, the Department of Defense, and the National Science Foundation. The director of the Center and the Frank Carden Chair is Professor Dr. Charles Creusere.

The Advanced Speech and Audio Processing Laboratory is used for both teaching and research in digital signal processing (DSP). Current research areas include speaker recognition, signal enhancement, low-bit rate coding, embedded DSP, and GPU-based pattern recognition for speech processing. The laboratory is equipped with two state-of-the-art compute servers equipped with Intel Core i7-960 3.2 GHz and NVIDIA C2050 GPU processor. Research sponsors for the laboratory include Air Force Research Laboratories, Army Research Laboratory, National Geospatial Intelligence Agency, Freescale Semiconductor, IBM, Motorola, National Science Foundation, and Texas Instruments. The director of the laboratory is Dr. Phillip L. De Leon.

The New Mexico State University R.L. Golden Particle Astrophysics Lab (PAL) is dedicated to measuring and interpreting cosmic ray spectra in an effort to better understand the structure of our universe. Recent measurements of the galactic positron and electron spectra have connections to the dark matter mystery and to the identification of sources of cosmic rays. Additional studies of solar particles (measured along with cosmic rays) will help in the understanding of how solar eruptions affect the earth. The director of PAL is Dr. Steven Stochaj.

The Electromagnetics (EM) and Microwave Laboratory is used for both teaching and research in electromagnetic fields. Current research areas include propagation through dispersive media (soil, seawater, foliage, biological tissues), UWB radar and remote sensing system analysis and design, antenna analysis, synthesis, and design, bio-electromagnetics, brain mapping, computational physics, electromagnetic interference and compatibility, high performance computing, and nondestructive evaluation. Research sponsors for the laboratory include American Heart Association, Department of Defense, Los Alamos National Laboratory, NASA, NSF, National Institutes of Health, Sandia National Laboratories, and White Sands Missile Range. The Director of the Electromagnetics and Microwave Laboratory is Dr. Kwong T. Ng.

New Mexico State University's program in Electric Utility Management (EUMP) is sponsored by a group of public and private electric utility companies and industrial organizations and hosts the PNM Chair for Utility Management and The Kersting Professorship. The Master of Science in Electrical Engineering degree program includes course work in public utilities regulation and is designed to prepare the student for a future engineering management position in the electric utility industry. An industry advisory committee provides the vital connecting link between the electric utility industry and the university, so that a coordinated effort may be achieved in realizing the following program objectives: (1) to provide a program of study at the graduate level in the planning, operation, and management of electric power generation, transmission, distribution, and utilization; (2) to supply the electric utility industry with the highest caliber of new engineering and management talent; and (3) to provide the university with the required financial and technical support to ensure a quality program. In addition, faculty in EUMP work with MS and Ph.D students to conduct funded research sponsored by Sandia National Laboratories, EPRI, NSF, DOE, CEC and the electrical utility industry. Much of the current research is focused on renewable energy integration, protection, advanced control and optimization, and customer driven microgrids. Laboratory facilities are available in the El Paso Electric Power Systems laboratory. The program works closely with the Institute for Energy and Environment (IEE) and with Southwest Technology Development Institute (SWTDI) which host the solar energy experiment station. The director of the EUMP and PNM Chair for Utility Management is Dr. Satish Ranade.

Faculty and students in the VLSI Laboratory are involved in the design and analysis of analog and mixed-signal microelectronic circuits and systems. Current research areas include high-frequency analog VLSI design; low-voltage, low-power circuits; high performance operational amplifiers and operational transconductance amplifiers; power management circuits; analog image processing; and CMOS image sensors. Research sponsors include the Los Alamos National Laboratories and Agilent technologies. The director of the VLSI Laboratory is IEEE Fellow Dr. Jaime Ramirez-Angulo.

The Electro-Optics program at NMSU offers unique opportunities to undergraduate and graduate students interested in pursuing a career in electro-optics, applied optics, photonics, or optical engineering by combining the optics resources of the Klipsch School and the Physics Department. Most of the optics classes are cross-listed in the two departments. The Klipsch School's Electro-Optics Research Laboratory (EORL) provides a variety of research opportunities in areas such as multispectral and polarimetric imaging, free-space optical communications, adaptive optics, nanophotonics and integrated electro-optic sensors and systems. Sponsors include the Air Force Office of Scientific Research, Sandia National Laboratories, Air Force Research Laboratory, Army Research Laboratory, NASA, National Geospatial-Intelligence Agency and the National Science Foundation. SPIE Fellow Dr. David G. Voelz is the director of the EORL and NMSU's Electro-Optics program.

The Computer Networking Lab (CNL) supports teaching and research in Internet and wireless sensor networks. The mission of CNL is to provide students with the opportunity to do cutting-edge research that has high practical relevance. Currently, research projects in CNL include secure data dissemination in wireless sensor networks, solar-powered sensor networks, and RFID sensor networks. The major research sponsors of CNL include US Army, DHS, Intel, Los Alamos National Lab, and Sandia National Lab. CNL is directed by Dr. Hong Huang.

Students and faculty associated with the Advanced Computer Architecture Performance and Simulation (ACAPS) Laboratory conduct research in the areas of performance modeling and simulation techniques, micro-architecture power optimization, performance analysis and optimization of large-scale scientific applications, and heterogeneous HPC computing for field-deployable systems. Equipment in the lab includes numerous state-of-the-art workstations, several contemporary servers, nVidia Tesla GPUs, Xilinx FPGAs, and more than 8TB of

storage. ACAPS sponsors include the National Science Foundation, the Army High Performance Computing Research Center (AHPCRC), Sandia National Laboratories, Hewlett-Packard, and IBM. The laboratory's director is Dr. Jeanine Cook.

The Advanced Computer Engineering Laboratory (ACSEL, www.acsel-lab.com) is engaged in solving problems related to high-performance and low-power computing systems with focus on VLSI chip engineering. ACSEL members are experts in high-speed digital circuits as well as low-power and ultra-low power design, specializing in energy efficient design, low-power digital circuit libraries and optimal relationship between computational energy and speed. ACSEL broader expertise is in Computer Arithmetic, Media Signal Processing, Hardware Security, Computer Architecture and Super-Computing. ACSEL sponsors are major computer and semiconductor companies such as: IBM, Intel, AMD, Fujitsu etc, as well as Semiconductor Research Council (SRC) and NSF. The director of ACSEL is IEEE Fellow, Dr. Vojin G. Oklobdzija.

The Rio Grande Institute for Soft Computing (*RioSoft*) is committed to serving private-sector and U.S. government needs in researching and developing intelligent decision-support systems and tools that aid in many aspects of strategic decision-making. Soft computing which includes fuzzy logic, neural networks, and evolutionary computation are used for modeling, analysis, and control of complex dynamical processes in various software-hardware integrated architectures. In addition RioRoboLab, a NASA Ames funded laboratory, provides facilities for research and development of intelligent autonomous and semi-autonomous systems focusing on advanced concepts of energy harvesting and energy scavenging from ambient energy sources. Research sponsors include the Defense Threat Reduction Agency, Defense Advanced Research Projects Agency, Los Alamos National Laboratory, and NASA. The director of *RioSoft* and *RioRoboLab* is Dr. Nadipuram (Ram) Prasad.

The Kazda Control Systems Laboratory is dedicated to the support of education and research in the area of Control Systems. Research involves collaborative efforts with the Mechatronics Lab in the Department of Mechanical and Aerospace Engineering, covering a wide area of robotics applications. The current thrust is a joint effort of M E, E E, and I E in the Reduced-Gravity/Biomechanics (RGB) Lab. This lab is sponsored by the National Science Foundation under the Major Research Instrumentation (MRI) grant. The purpose of the lab is to develop a reduced gravity simulator that can be used for research in Mechanical Engineering, Electrical Engineering, Human Biodynamic modeling, Ergonomics, Medical Rehabilitation, Dance, and Space Applications. The director of Kazda Control Systems Laboratory is Dr. Robert Paz.

SUPPORT FOR GRADUATE STUDENTS

A number of teaching assistantships, research assistantships, and fellowships are available. Teaching assistants are recommended by individual faculty for selection by the ECE Department's Graduate Studies Committee. International students must pass university screening prior to being eligible for selection as a TA. Nominations for new TAs are made by the advisor after a student is admitted. Research assistants are hired directly by the faculty member who has received a contract or grant for research.

The College of Engineering awards graduate scholarships and fellowships on behalf of Electrical and Computer Engineering. These include: the MIT/Lincoln Laboratory Fellowship, the Paul and Valerie Klipsch Grad Scholarship, the Admiral Paul Arthur Grad Scholarship, and the Barry Neil Rappaport Grad Scholarship. Applications can be completed on-line at <http://enr.nmsu.edu/scholarships.shtml> on or before March 1. The Electrical Utility Management Program has a limited number of fellowships for students interested in pursuing master's degrees in electrical energy systems.

ADMISSION

Prospective graduate students for the Master of Science or Doctor of Philosophy in Electrical Engineering must first meet the entrance requirements of the Graduate School. The prospective US graduate student should make formal application to the Graduate Student Services office (<http://gradschool.nmsu.edu/admit-form.html>). International graduate students must start with the Admissions Office (<http://international.nmsu.edu/admissions.html>). Official transcripts from all undergraduate and graduate institutions must be sent directly to the Graduate School. In addition, the student must arrange to have an official copy of the GRE (Graduate Record Examination) General Test scores sent to the Graduate School. International students must also submit their TOEFL (Test of English as a Foreign Language) scores. If the applicant meets the Graduate School's minimum requirements, the application is sent to the Klipsch School's Graduate

Studies Committee for review. U.S. residents are given every chance of being successful in the pursuit of a graduate degree. If they do not meet the requirements of the Klipsch School, they can enter the Graduate School as "undeclared" where they must demonstrate competence in two or more graduate-level E E courses before they re-apply.

REQUIREMENTS FOR PH.D. DEGREE

The Program Educational Objectives for the Doctorate in Electrical Engineering are:

1. That graduates obtain relevant, productive employment performing research in academia, government, or industry, and/or are teaching at institutions of higher education.
2. That graduates obtain relevant, productive employment with the private sector or in government and/or pursue additional advanced degrees.

The Ph.D. program is open to students with a master's degree. Exceptionally well qualified students may petition for direct entry to the Ph.D program without first obtaining a master's degree.

Option 1 - Ph.D. with completed MS degree

1. Complete undergraduate deficiency coursework, if the student admitted has both master's and bachelor's degrees in fields other than electrical engineering. Complete graduate deficiency coursework, which consists of three graduate core courses from three different areas of emphasis, if the student has a master's degree in a field other than electrical engineering.
2. Complete a minimum of 18 credits beyond the master's of graduate course work with the following restrictions:
 - a. E E courses must be numbered 500 or higher. Non-E E courses must be 450 or higher.
 - b. At least half of the 18 credits must be taken in the Klipsch School (E E).
 - c. At most 6 credits may be research, for example, E E 600, Doctoral Research, and E E 590 courses that are not listed as regular courses in the schedule.
 - d. Exclude credits of E E 700 Doctoral Dissertation.
 - e. If the MS degree is not E E, exclude credits from graduate deficiency coursework.

Option 2 - Direct Ph.D. with B.S.E.E or equivalent, but no MS degree

1. Complete three graduate core courses.
2. Complete a minimum of 42 credits of graduate coursework, including the three graduate core courses with the following restrictions:
 - a. At least half of the 42 credits must be numbered 500 or higher.
 - b. At least half of the 42 credits must be taken in the Klipsch School (E E).
 - c. At most 9 credits may be research, for example, E E 600, Doctoral Research, and E E 590 courses that are not listed as regular courses in the schedule.
 - d. Exclude credits of E E 700 Doctoral Dissertation.
 - e. Exclude credits from E E490, C S 457/467/477/487, BCS 472, SPCD 470/490, and COMM 485.
 - f. At least half of the credits must be taken with other than a single professor.

Common Requirements for all Ph.D. candidates

3. Participate in one semester of research seminars (E E 501, 1cr.)
4. Take and pass the Ph.D qualifying exam.
5. Pass a comprehensive examination. The examination must be part written and part oral. The specific format of the exam is at the discretion of the examination committee. It may cover course work, include a proposal for dissertation research, and may be preceded by a written exam.
6. Complete 18 credits of E E 700 doctoral dissertation.
7. Submit evidence for a minimum of two publications related to the dissertation research, one of which is submitted to an internationally- recognized journal, such as IEEE Transactions, and the second of which may be with a professional conference, such as an IEEE conference.
8. Pass a final oral exam which defends the dissertation.

Other limitations and requirements that apply to all Ph.D. degrees are described elsewhere in this catalog.

PH.D. QUALIFYING EXAM

The Ph.D. Qualifying Exam is typically offered on the Monday just prior to the beginning of each semester. The format is one half day written exam. The examination indicates a readiness for research at the graduate level. Students answer a total of six questions with two coming from each of three areas of emphasis. Taking three graduate core courses (listed below) prepares students for the Ph.D. qualifying exam.

REQUIREMENTS AND OPTIONS FOR M.S.E.E. DEGREE

The Program Educational Objectives for the Master of Science Program in Electrical Engineering are:

1. That graduates successfully apply advanced skills and techniques in one or more areas of emphasis.
2. That graduates obtain relevant, productive employment with the private sector or in government and/or pursue additional advanced degrees.

Three options exist for the Master of Science in Electrical Engineering degree. The requirements for each option are listed below:

1. Thesis- 24 credits of course work plus 6 credits of E E 599 plus oral exam
2. Technical Report- 27 credits of course work plus 3 credits of E E 598 plus oral exam
3. Course Work Only- 30 credits of course work plus oral exam or the graduate portion of the Ph.D. qualifying exam

Credits of E E 490/498/499, C S 457/467/477/487, BCS 472, COMM 485, and SPCD 470/490 do not count toward a graduate degree. Credits of E E 590, Selected Topics, are limited to a total of 9, of which at most 6 may be credits for courses that don't appear as regular classes in the printed schedule. Each area of specialization may have additional requirements for students in those areas. Other limitations and requirements that apply to all master's degrees are described elsewhere in this catalog.

B.S./M.S. PROGRAM

This program option is designed to provide a means for ECE undergraduates to obtain both a B.S.E.E. and a M.S.E.E. degree with 153 credit hours of coursework (normally: B.S.E.E. = 129 hours, M.S.E.E. = 30 hours; total = 159 hours). Students electing to utilize this option will follow the existing undergraduate curriculum for the first seven semesters. In the final undergraduate semester, two graduate courses (>450 level) will be taken in lieu of two ECE electives listed in the undergraduate curriculum. The student receives a B.S.E.E. degree at this point. A M.S.E.E. program can be completed in three additional semesters. Students must obtain prior approval of the department before starting this program option.

GRADUATE CORE COURSES AND BREADTH ELECTIVES

The M.S.E.E. program requires students to participate in one semester of research seminars (E E 501, 1 cr.) and take two graduate core courses from two different areas of emphasis. In addition, either a third graduate core course OR one graduate breadth course must be taken from a third area of emphasis. If a student wishes to pursue a Ph.D., the third class should come from the core class list as preparation for the Ph.D. qualifying exam. The graduate core courses, specialty areas, and credits are listed below for the Graduate Core Courses and the Graduate Breadth Electives:

Graduate Core Courses:

E E 515, Electromagnetic Theory I (Electromagnetics)	3 cr.
E E 523, Analog VLSI Design (Microelectronics/VLSI)	3 cr.
E E 528, Optical Sources, Detectors, Radiometry (Electro-optics) or	4 cr.
E E 529, Lasers and Applications (Electro-optics).....	4 cr.
E E 543, Power Systems III (Electric Energy Systems)	3 cr.
E E 545, Digital Signal Processing II (Digital Signal Processing)	3 cr.
E E 551, Control Systems Synthesis I (Control Systems)	3 cr.
E E 563, Computer Performance Analysis I (Comp. Engineering) or	3 cr.
E E 564, Advanced Computer Architecture I (Comp. Engineering).....	3 cr.
E E 571, Random Signal Analysis (Communications)	3 cr.

The graduate breadth electives are listed below:

E E 524, Digital VLSI Design (Microelectronics/VLSI).....	3 cr.
E E 537, Power Electronics (Electric Energy Systems)	3 cr.
E E 541, Antennas and Radiation (Electromagnetics)	3 cr.

E E 555, Advanced Linear Systems (Control Systems and Digital Signal Processing)	3 cr.
E E 581, Digital Communications I (Communications).....	3

M.S.E.E. COURSEWORK OPTION FINAL EXAM

The M.S.E.E. Coursework Option Final Exam is typically offered on the Monday just prior to the beginning of each semester. The format is a half day written exam. Students answer a total of four questions with two coming from each of two areas of emphasis. Taking two graduate core courses (listed above) prepares students for the exam. The coursework option is limited to students who receive one semester or less from the department in the form of a teaching or research assistant.

REQUIREMENTS FOR STUDENTS WITHOUT B.S.E.E. DEGREE OR EQUIVALENT

Students without a B.S.E.E. degree or equivalent preparation will be expected to take classes covering the core knowledge required in our B.S.E.E. program. This includes mathematics through differential equations and basic engineering physics. The student's graduate advisor will prepare an individualized deficiency schedule, based on the student's academic background and work experience. The following course from our undergraduate program will be considered deficiencies for students without a B.S.E.E.:

E E 161, Computer Aided Problem Solving.....	4 cr.
E E 162, Digital Circuit Design.....	4 cr.
E E 210, Engineering Analysis I.....	4 cr.
E E 260, Embedded Systems.....	4 cr.
E E 280, DC and AC Circuits.....	4 cr.
E E 310, Engineering Analysis II	3 cr.
E E 312, Signals and Systems I.....	3 cr.
E E 314, Signals and Systems II.....	4 cr.
E E 351, Applied Electromagnetics.....	4 cr.
E E 380, Electronics I.....	4 cr.

ELECTRICAL AND COMPUTER ENGINEERING

E E 452. Introduction to Radar	3 cr.
Basic concepts of radar. Radar equation; detection theory. AM, FM, and CW radars. Analysis of tracking, search, MTI, and imaging radar. Taught with E E 548. Restricted to undergraduate students. Prerequisite(s): C or better in E E 210 and E E 351. Pre/Corequisite(s): E E 496.	
E E 453. Microwave Engineering	3 cr.
Techniques for microwave measurements and communication system design, including transmissions lines, waveguides, and components. Microwave network analysis and active device design. Taught with E E 521. Restricted to undergraduate students. Prerequisite(s): C or better in E E 351.	
E E 454. Antennas and Radiation	3 cr.
Basic antenna analysis and design. Fundamental antenna concepts and radiation integrals. Study of wire antennas, aperture antennas, arrays, reflectors, and broadband antennas. Taught with E E 541. Restricted to undergraduate students. Prerequisite(s): C or better in E E 351.	
E E 460. Space System Mission Design and Analysis	3 cr.
Satellite system design, including development, fabrication, launch, and operations. A systems engineering approach to concepts, methodologies, models, and tools for space systems. Prerequisite: junior standing.	
E E 461. Systems Engineering and Program Management	3 cr.
Modern technical management of complex systems using satellites as models. Team projects demonstrate systems engineering disciplines required to configure satellite components. Prerequisite(s): Junior standing.	
E E 469. Communications Networks	3 cr. (2+3P)
Introduction to the design and performance analysis of communications networks with major emphasis on the Internet and different types of wireless networks. Covers network architectures, protocols, standards and technologies; design and implementation of networks; networks applications for data, audio and video; performance analysis. Prerequisite(s): C or better in E E 162 and (E E 210 or STAT 371).	
E E 470. Physical Optics	3 cr.
Interference and diffraction, spectroscopic instrumentation, coherence, laser and Gaussian laser beam, and elements of nonlinear optics and fiber optics. Prerequisite: E E 370; and PHYS 214, PHYS 216G, or PHYS 217. Same as PHYS 470.	
E E 471. Modern Experimental Optics	2 cr. (6P)
Advanced laboratory experiments in optics related to the material pre-	

- mented in E E 470. Pre/Corequisite(s): E E 470. Crosslisted with: PHYS 471
- E E 473. Introduction to Optics 3 cr.
The nature of light, geometrical optics, basic optical instruments, wave optics, aberrations, polarization, and diffraction. Elements of optical radiometry, lasers and fiber optics. Prerequisite(s): PHYS 216 or PHYS 217. Crosslisted with: PHYS 473
- E E 475. Control Systems II 3 cr.
Design and synthesis of control systems using state variable and frequency domain techniques. Compensation, optimization, multi-variable system design techniques. Prerequisite: C or better in E E 314.
- E E 476. Computer Control Systems 3 cr.
Representation, analysis and design of discrete-time systems using time-domain and z-domain techniques. Microprocessor control systems. Prerequisite: C or better in E E 314.
- E E 477. Fiber Optic Communication Systems 4 cr. (3+3P)
Fundamental characteristics of individual elements (transmitters, detectors, and fibers) of fiber optic communication systems. Design and characterization of high-speed, multichannel fiber optic communication links. Introduction to fiber optic distribution. Prerequisite(s): C or better in E E 351 or PHYS 461. Crosslisted with: PHYS 477
- E E 478. Optical Sources, Detectors and Radiometry 4 cr. (3+3P)
Fundamentals of optical sources, detectors, and radiometric measurements in the visible and infrared. Radiometry of imaging and nonimaging optical systems. Detector preamplifiers, noise, NEP, D, optical filters, and sensor systems. Taught with E E 528. Recommended foundation: E E 370. Prerequisite(s): PHYS 217. Crosslisted with: PHYS 478
- E E 479. Lasers and Applications 4 cr. (3+3P)
Laser operating principles, characteristics, construction and applications. Beam propagation in free space and fibers. Laser diode construction and characteristics. Hands-on laboratory. Prerequisite(s): C or better in E E 351 or PHYS 461. Crosslisted with: PHYS 479
- E E 480. Introduction to VLSI 4 cr. (3+3P)
Introduction to analog and digital VLSI circuits implemented in CMOS technology. Design of differential amplifiers, opamps, CMOS logic, flip-flops, and adders. Introduction to VLSI fabrication process and CAD tools. Prerequisite(s): C or better in E E 260 and E E 380.
- E E 482. Electronics II 3 cr.
Feedback analysis, application of operational amplifiers, introduction to data converters, analog filters, oscillator circuits.. Prerequisite: C or better in E E 161 and E E 380.
- E E 483. RF Microelectronics 3 cr.
Analysis, design and implementation of RF integrated circuits in CMOS/BJT technologies. Low noise amplifiers and mixers, power amplifiers, wideband amplifiers, oscillators, phase-locked frequency synthesizers. Taught with E E 519. Restricted to undergraduate students. Prerequisite(s): C or better in E E 480 and E E 351.
- E E 485. Analog VLSI Design 3 cr. (2+3P)
Analysis, design, simulation, layout and verification of CMOS analog building blocks, including references, opamps, switches and comparators. Teams implement a complex analog IC. Taught with E E 523. Restricted to undergraduate students. Prerequisite(s): C or better in E E 312 and E E 480.
- E E 486. Digital VLSI Design 3 cr.
An introduction to VLSI layers. Static and dynamic logic design, memory circuits, arithmetic operators, and digital phase-locked loops. Taught with E E 524. Restricted to undergraduate students. Prerequisite(s): C or better in E E 260 and E E 380.
- E E 486 L. Digital VLSI Design Laboratory 1 cr. (3P)
Simulation, schematic capture, layout, and verification using software tools of material presented in E E 486. An introduction to measurement of digital VLSI circuits. Taught with E E 524L. Prerequisite(s): C or better in E E 260 and E E 380. Pre/Corequisite(s): E E 486.
- E E 490. Selected Topics 1-3 cr.
Prerequisite: consent of instructor. May be repeated for a maximum of 9 credits. Graduate students may not use credits of E E 490 toward an M.S. or Ph.D. in electrical engineering.
- E E 493. Power Systems III 3 cr.
Analysis of a power system under abnormal operating conditions. Topics include symmetrical three-phase faults, theory of symmetrical components, unsymmetrical faults, system protection, and power system stability. Taught with E E 543. Restricted to undergraduate students. Prerequisite(s): C or better in E E 391. Pre/Corequisite(s): E E 431.
- E E 494. Distribution Systems 3 cr.
Concepts and techniques associated with the design and operation of electrical distribution systems. Taught with E E 544. Restricted to undergraduate students. Prerequisite(s): C or better in E E 431. Pre/Corequisite(s): E E 493.
- E E 496. Introduction to Communication Systems 4 cr. (3+3P)
Introduction to the analysis of signals in the frequency and time domains. A study of baseband digital transmission systems and digital/analog RF transmission systems. Introduction to telecom systems as well as satellite systems. Prerequisite(s): C or better in E E 314.
- E E 497. Digital Communication Systems I 3 cr.
Techniques for transmitting digital data over commercial networks. Topics include baseband and bandpass data transmission and synchronization techniques. Taught with E E 581. Recommended foundation: E E 496. Prerequisite(s): E E 210 and E E 314.
- E E 500. Special Problems 1-9 cr.
Individual investigation in a particular field of electrical engineering. May be repeated for a maximum of 9 credits.
- E E 501. Research Topics in Electrical and Computer Engineering 1 cr.
Ethics and methods of engineering research; contemporary research topics in electrical and computer engineering. Taught with E E 401 with differentiated assignments for graduate students.
- E E 513. Active Network Synthesis 3 cr.
Active network synthesis, including sensitivity of circuits, operational amplifier realizations of cascaded and coupled active filters, and gyrator and frequency-dependent-negative-resistor realizations. Recommended preparation is E E 312 or equivalent.
- E E 515. Electromagnetic Theory I 3 cr.
Electromagnetic theory of time-harmonic fields in rectangular, cylindrical and spherical coordinates with applications to guided waves and radiated waves. Induction and equivalence theorems, perturbational and variational principles applied to engineering problems in electromagnetics. Recommended preparation is E E 351 or equivalent.
- E E 516. Electromagnetic Theory II 3 cr.
Continuation of E E 515.
- E E 519. RF Microelectronics 3 cr.
Analysis, design and implementation of RF integrated circuits in CMOS/BJT technologies. Low noise amplifiers and mixers, power amplifiers, wideband amplifiers, oscillators, phase-locked frequency synthesizers. Recommended preparation is E E 351 and E E 480 or equivalent. Taught with E E 483 with differentiated assignments for graduate students.
- E E 520. A/D and D/A Converter Design 3 cr.
Practical design of integrated data converters in CMOS/BJT technologies, OP-AMPS, comparators, sample and holds, MOS switches, element mismatches. Nyquist rate converter architectures: flash, successive approximation, charge redistribution, algorithmic, two step, folding, interpolating, pipelined, delta-sigma converters. Prerequisite(s): E E 523.
- E E 521. Microwave Engineering 3 cr.
Techniques for microwave measurements and communication system design, including transmission lines, waveguides, and components. Microwave network analysis and active device design. Recommended preparation is E E 351 or equivalent. Taught with E E 453 with differentiated assignments for graduate students.
- E E 522. Advanced Analog VLSI Design 3 cr.
Design of high-performance operational amplifiers; class-AB, rail-to-rail, low-voltage, high-bandwidth, fully-differential. Design of linear operational transconductance amplifiers, high-frequency integrated filters, four-quadrant multipliers, and switched-capacitor circuits. Prerequisite(s): E E 523.
- E E 523. Analog VLSI Design 3 cr. (2+3P)
Analysis, design, simulation, layout and verification of CMOS analog building blocks, including references, opamps, switches and comparators. Teams implement a complex analog IC. Recommended preparation is E E 312 and E E 480 or equivalent. Taught with E E 485 with differentiated assignments for graduate students.
- E E 524. Digital VLSI Design 3 cr.
An introduction to VLSI layers. Static and dynamic logic design, memory circuits, arithmetic operators, and digital phase-locked loops. Taught with E E 486 with differentiated assignments for graduate students. Recommended foundation: E E 260 and E E 380.
- E E 524 L. Digital VLSI Design Laboratory 1 cr. (3P)
Simulation, schematic capture, layout, and verification using software tools of material presented in E E 524. An introduction to measurement of digital VLSI circuits. Taught with E E 486L with differentiated assignments for graduate students.
- E E 525. Introduction to Semiconductor Devices 3 cr.
Energy bands, carriers in semiconductors, junctions, transistors, and optoelectronic devices, including light-emitting diodes, laser diodes, photodetectors, and solar cells. Recommended preparation is E E 380 and E E 351. Taught with: E E 425 with differentiated assignments for graduate students.

- E E 526. CMOS Image Sensors** 3 cr.
Design, simulation, layout and testing of CMOS image sensors. Covers passive-pixel, active-pixel, and logarithmic photo-sensors, readout circuitry, and timing circuits for automatic frame generation. Includes teamwork, written and oral communication, and realistic technical requirements. Prerequisite(s): E E 486 or E E 524. Pre/Corequisite(s): E E 485 or E E 523.
- E E 527. Fiber Optic Communication Systems** 4 cr. (3+3P)
Fundamental characteristics of individual elements (transmitters, detectors, and fibers) of fiber optic communication systems. Design and characterization of high-speed, multichannel fiber optic communication links. Introduction to fiber optic distribution. Recommended foundation: E E 351 or PHYS 461. Crosslisted with: PHYS 527
- E E 528. Optical Sources, Detectors, and Radiometry** 4 cr. (3+3P)
Fundamentals of optical sources, detectors, and radiometric measurements in the visible and infrared. Radiometry of imaging and nonimaging optical systems. Detector preamplifiers, noise, NEP, D, and optical filters. Taught with E E 478 with differentiated assignments for graduate students. Recommended foundation: PHYS 217 and E E 370. Crosslisted with: PHYS 528
- E E 529. Lasers and Applications** 4 cr. (3+3P)
Laser operating principles, characteristics, construction and applications. Beam propagation in free space and fibers. Laser diode construction and characteristics. Hands-on laboratory. Recommended foundation: E E 351 or PHYS 461. Crosslisted with: PHYS 529
- E E 530. Environmental Management Seminar I** 1 cr.
Same as CH E 530, C E 530, I E 530.
- E E 531. Power System Modeling and Computational Methods** 3 cr.
Development and analysis of fast computational methods for efficient solution of large scale power-system problems. Algorithms for constructing the bus impedance matrix; sparse matrix techniques; partial- inverse methods; compensation of mutual coupling. Pre/Corequisite(s): E E 543.
- E E 532. Dynamics of Power Systems** 3 cr.
Transient and dynamic stability of power systems; synchronous machine modeling and dynamics; prediction and stabilization of system oscillations. Recommended preparation is E E 493 or equivalent.
- E E 533. Power System Operation** 3 cr.
AGC, economic dispatch, unit commitment, operations planning, power flow analysis and network control, system control centers. Recommended preparation is E E 493 or equivalent.
- E E 534. Power System Relaying** 3 cr.
Fundamental relay operating principles and characteristics. Current, voltage, directional, differential relays; distance relays; pilot relaying schemes. Standard protective schemes for system protection. Operating principles and overview of digital relays. Recommended preparation is E E 493 or equivalent.
- E E 535. Power System Reliability and Risk Assessment** 3 cr.
Probability applications in power systems; stochastic modeling of power system components and networks. Reliability modeling and analysis of generation systems, composite (generation and transmission) systems, interconnected systems, distribution systems, industrial and commercial systems. Analysis of risk in power systems; understanding of causes and remedial measures. Prerequisite: consent of instructor.
- E E 536. Power System Overvoltage Transients** 3 cr.
Introduction of the origin and analysis of overvoltage and other transients in power systems. Basic principles of design to control and protect against overvoltages and to provide an overview of applicable standards and testing methods. Use of the electromagnetic transients program (EMTP). Recommended preparation is E E 493 or equivalent.
- E E 537. Power Electronics** 3 cr. (2+3P)
Basic principles of power electronics and its applications to power supplies, electric machine control, and power systems. Recommended preparation is E E 314, E E 380, and E E 391. Taught with E E 432 with differentiated assignments for graduate students.
- E E 538. Advanced Distribution Systems** 3 cr.
Continuation of E E 494 and E E 544. Emphasis is directed toward the overall coordinated protection of distribution feeders. Distribution system reliability, performance indexes and economics are presented. Recommended preparation is E E 494 or equivalent.
- E E 539. Electric Power Quality** 3 cr.
Power quality, harmonics, and related problems in electric power systems, their causes, and effects. Applicable standards, instrumentation, analysis procedures, and mitigation. Recommended preparation is E E 493 or equivalent.
- E E 540. Applied Power System Analysis** 3 cr.
Analysis of a practical power system using a library of computer programs.
- Includes determination of transmission line constants, power flow, economic loading of generators, short circuit behavior, and stability. Prerequisite: E E 531.
- E E 541. Antennas and Radiation** 3 cr.
Basic antenna analysis and design. Fundamental antenna concepts and radiation integrals. Study of wire antennas, aperture antennas, arrays, reflectors, and broadband antennas. Recommended preparation is E E 351 or equivalent. Taught with E E 454 with differentiated assignments for graduate students.
- E E 542. Power Systems II** 3 cr.
Analysis of a power system in the steady-state. Includes the development of models and analysis procedures for major power system components and for power networks. Recommended preparation is E E 391 or equivalent. Taught with E E 431 with differentiated assignments for graduate students.
- E E 543. Power Systems III** 3 cr.
Analysis of a power system under abnormal operating conditions. Topics include symmetrical three-phase faults, theory of symmetrical components, unsymmetrical faults, system protection, and power system stability. Recommended preparation is E E 431 or equivalent. Taught with E E 493 with differentiated assignments for graduate students.
- E E 544. Distribution Systems** 3 cr.
Concepts and techniques associated with the design and operation of electrical distribution systems. Recommended preparation is E E 542 and E E 543. Taught with E E 494 with differentiated assignments for graduate students.
- E E 545. Digital Signal Processing II** 3 cr.
Non-ideal sampling and reconstruction, oversampling and noise shaping in A/D and D/A, finite word length effects, random signals, spectral analysis, multirate filter banks and wavelets, and applications. Recommended preparation is E E 395 or equivalent.
- E E 548. Introduction to Radar** 3 cr.
Basic concepts of radar. Radar equation; detection theory, AM, FM, and CW radars. Analysis of tracking, search, MTI, and image radar. Recommended preparation is E E 310, E E 351, and E E 496 or equivalent. Taught with E E 452 with differentiated assignments for graduate students.
- E E 551. Control System Synthesis I** 3 cr.
An advanced perspective of linear modern control system analysis and design, including the essential algebraic, structural, and numerical properties of linear dynamical systems.
- E E 552. Control System Synthesis II** 3 cr.
An overview of optimal controls for linear dynamical systems, analysis and design of control systems using Lyapunov techniques, control system design using semidefinite programming. An introduction to stochastic filtering and control.
- E E 555. Advanced Linear Systems** 3 cr.
Advanced level study of linear systems and associated mathematical tools including linear equations, spectral theory, normal matrices, projections, quadratic forms, discrete and continuous time dynamical systems. Recommended preparation is MATH 480 or equivalent.
- E E 560. Computer Network Security** 3 cr.
An introduction to computer network security, addressing security protocols, cryptology, and information assurance. Recommended preparation is E E 469 or equivalent and C programming skills.
- E E 561. Sequential Machines I** 3 cr.
Fault detection of combinational circuits. Representation, equivalents, reduction, decomposition and fault detection of sequential machines. Recommended preparation is E E 363 or equivalent.
- E E 563. Computer Performance Analysis I** 3 cr.
Issues involved and techniques used to analyze performance of a computer system. Topics covered include computer system workloads; statistical analysis techniques such as principal component analysis, confidence interval, and linear regression; design and analysis of experiments; queuing system analysis; computer system simulation; and random number generation. Recommended foundation: E E 210 and E E 363.
- E E 564. Advanced Computer Architecture I** 3 cr.
Multiprocessor and distributed computer architectures, models of parallel computation, processing element and interconnection network structures, and nontraditional architectures. Recommended preparation is E E 363 or equivalent.
- E E 565. Pattern Recognition** 3 cr.
Statistical pattern classification, supervised and unsupervised learning, feature selection and extraction, clustering, image classification and syntactical pattern recognition. Prerequisite: E E 571 or equivalent.

- E E 566. Parallel Computer Architecture I** 3 cr.
Parallel computer architectures primarily focused on message-passing architectures, but including shared-memory architectures. Scalable multi-processors, directory-based cache coherence, synchronization, programming models, the parallelization process, workload-driven analysis and evaluation. Recommended preparation is E E 363 or C S 473.
- E E 568. Wireless Networks** 3 cr.
Challenges of node mobility and wireless channels. Protocols and architectures for wireless data communications. Modeling and simulation of wireless networks. Advanced topics in wireless networks from current literature. Recommended preparation is EE 469 or equivalent.
- E E 569. Advanced Computer Networking** 3 cr.
Advanced topics in computer networking, guided by current literature. Recommended preparation is EE 469 or equivalent and C programming skills.
- E E 570. Advanced Physical Optics** 3 cr.
Same as PHYS 570. Crosslisted with: PHYS 570
- E E 571. Random Signal Analysis** 3 cr.
Application of probability and random variables to problems in communication systems, analysis of random signal and noise in linear and nonlinear systems.
- E E 572. Coding Theory** 3 cr.
Error control techniques for digital transmission and storage systems. Introduction to basic coding bounds, linear and cyclic block codes, Reed-Solomon codes, convolutional codes, maximum likelihood decoding, maximum a posteriori probability decoding, factor graphs, low density parity check codes, turbo codes, iterative decoding. Applications to data networks, space and satellite transmission, and data modems. Recommended foundation is E E 210 and E E 496.
- E E 573. Signal Compression** 3 cr.
Fundamentals of information source encoding and decoding. Includes information theory bounds on source coding, lossless coding algorithms, scalar quantizing and vector quantizing. Prerequisite: E E 571.
- E E 577. Fourier Methods in Electro-Optics** 3 cr.
Linear systems theory, convolution and Fourier transformation are applied to one-dimensional and two dimensional signals encountered in electro-optical systems. Applications in diffraction, coherent and incoherent imaging, and optical signal processing. Recommended foundation: E E 312 and E E 528. Crosslisted with: PHYS 577
- E E 578. Optical System Design** 3 cr.
Optical design software is used to study optical systems involving lenses, mirrors, windows and relay optics. Systems considered include camera lenses, microscopes and telescopes. Recommended foundation: E E 370, E E 528 and E E 577. Crosslisted with: PHYS 578
- E E 581. Digital Communication Systems I** 3 cr.
Techniques for transmitting digital data over commercial networks. Topics include baseband and bandpass data transmission and synchronization techniques. Recommended foundation is E E 210, E E 314, and E E 496. Taught with E E 497.
- E E 583. Personal Communications Systems** 3 cr.
Cellular systems, propagation, modulation, multiple access, and spread spectrum techniques for mobile radio, as well as smart antennas, networking, and standards for wireless systems. Prerequisite: E E 571.
- E E 584. Mathematical Methods for Communications and Signal Processing** 3 cr.
Applications of mathematical techniques from estimation theory, optimization principles and numerical analysis to the problems in communications and signal processing. Prerequisites: E E 571 and E E 555 or knowledge of linear algebra.
- E E 585. Telemetry Systems** 3 cr.
Covers the integration of components into a command and telemetry system. Topics include analog and digital modulation formats, synchronization, link effects, and applicable standards. Recommended preparation is E E 395, E E 496, and E E 497, or equivalent.
- E E 586. Information Theory** 3 cr.
This class is a study of Shannon's measure of information and discusses mutual information, entropy, and channel capacity, the noiseless source coding theorem, the noisy channel coding theorem, channel coding and random coding bounds, rate-distortion theory, and data compression. Prerequisite(s): E E 571 or STAT 515. Crosslisted with: MATH 509
- E E 589. Digital Speech Processing** 3 cr.
Speech signals analysis, coding, enhancement, recognition, and synthesis; introduction to linguistics and the human auditory and production systems. Prerequisite: E E 545.
- E E 590. Selected Topics** 1-9 cr.
May be repeated for a maximum of 18 credits.

- E E 591. Advanced Experimental Optics** 3 cr.
See PHYS 571. Crosslisted with: PHYS 571
- E E 592. Real-Time Digital Signal Processing** 3 cr.
Project-oriented course covering the fundamentals of real-time digital signal processing (DSP) by programming a state-of-the-art digital processor to solve a variety of problems in digital audio and communications engineering. Prerequisite: E E 545. Same as E E 442 with differentiated assignments for graduate students.
- E E 594. Adaptive Signal Processing (s)** 3 cr.
Wiener filters, linear prediction, least-mean-square algorithms, and recursive-least-squares algorithms with applications to prediction, system identification, equalization, and interference canceling. Prerequisites: E E 545 and E E 571.
- E E 595. Multirate Digital Signal Processing and Wavelets** 3 cr.
This class introduces material on multirate systems, multirate filter banks, wavelets, lapped orthogonal transformations, and lifting for fast implementations. Recommended preparation is E E 395.
- E E 596. Digital Image Processing** 3 cr.
Two-dimensional transform theory, color images, image enhancement, restoration, registration, segmentation, compression and understanding. Recommended foundation is E E 571. Taught with E E 446.
- E E 598. Master's Technical Report** 1-9 cr.
Individual investigation, either analytical or experimental, culminating in a technical report. May be repeated for a maximum of 18 credits. Graded PR/S/U.
- E E 599. Master's Thesis** 0-88 cr.
Thesis.
- E E 600. Doctoral Research** 1-88 cr.
Research.
- E E 615. Computational Electromagnetics** 3 cr.
The numerical solution of electromagnetics problems. Topics include differential equation techniques, integral equation methods, hybrid techniques, algorithm development and implementation, and error analysis. Particular algorithms, including FEM, finite differences, direct solvers, and iterative solvers, are studied.
- E E 671. Signal Detection and Estimation Theory** 3 cr.
Statistical decision theory with applications to optimum detection and estimation of signals in communications systems. Prerequisite: E E 571 or consent of instructor.
- E E 690. Selected Topics** 1-9 cr.
May be repeated for a maximum of 9 credits.
- E E 700. Doctoral Dissertation** 0-88 cr.
Dissertation.

INDUSTRIAL ENGINEERING

Department website: <http://ie.nmsu.edu/>
(575) 646-4923
ie@nmsu.edu

E. Pines, department head, Ph.D. (Penn State)-quality and continuous improvement, technology policy; N. B. Green, M.S. (New Mexico State)-engineering management, economic analysis; H. Sohn, Ph.D (Univ of Iowa)-operations research, discrete optimization, network design; J. Mullen, Ph.D. (Iowa State)-stochastic processes, quality, improvement, production system design; D. J. Valles-Rosales, Ph.D. (New Mexico State)- manufacturing systems, soft computing technologies, computer integrated manufacturing; Yu-Li Huang, Ph. D. (Michigan) - health care delivery systems, operations research, operations management

DEGREE: Master of Science in Industrial Engineering

DEGREE: Doctor of Philosophy

MAJOR: Engineering

CONCENTRATION: Industrial Engineering

The Department of Industrial Engineering offers graduate work leading to the degrees of Master of Science in Industrial Engineering and Doctor of Philosophy with specialization in industrial engineering. Areas of emphasis include computer modeling, operations research and systems engineering, manufacturing systems, quality, and reliability engineering.

Departmental admission requirements in addition to those of the Graduate School must be considered on an individual basis because of the diversity of backgrounds of applicants in the program. An applicant should meet or correspond directly with the department as a first step in determining his or her specific admission status. Applicants should present mathematics preparation equivalent to 9 credits of calculus for engineers, 3 credits of differential equations, and 3 credits of calculus-based probability and statistics.

Minimum credit-hour requirements for the master's degree may be met in any of the following ways: (1) 24 semester credits approved course work and 6 semester credits of thesis (I E 599) for a total of 30 semester credits, (2) 27 semester credits approved course work and 3 semester credits of project (I E 598) for a total of 30 semester credits, or (3) 30 semester credits of approved course work. Approved course work must meet all requirements of the Graduate School, represent a consistent master's program in relation to a student's graduate study goals as determined through consultation with the graduate program adviser, and be approved by a program committee of the graduate faculty of the department. Programs in the focus areas of engineering management, computer modeling, operations research, or manufacturing engineering can be developed with the aid of a faculty advisor.

Departmental facilities and equipment are available to support research efforts of graduate students, including computer terminals and laboratories. In addition to departmental facilities, supporting facilities such as the Manufacturing Technology and Engineering Center and five interdisciplinary Research Clusters are available for research work.

The Ph.D. program is research oriented with the final product being the dissertation. The general information chapter in this catalog describes the Ph.D. The program in industrial engineering also includes the following additions: the course work must include at least 12 credits at the 500 level in a related field, 6 credits of 600-level research courses covering two areas, and 18 credits of 700-level courses following successful completion of the comprehensive examination. The department does not have any foreign language or research tool requirements. Interested individuals should correspond directly with the department to determine eligibility for admission.

INDUSTRIAL ENGINEERING

- | | | |
|--|--------------|--|
| I E 451. Engineering Economy | 3 cr. | |
| Discounted cash flows, economics of project, contract and specifications as related to engineering design. Same as CH E 451. | | |
| I E 453. Leadership and Motivation | 3 cr. | |
| Theories of leadership and motivation. Motivational programs for complex organizations. Relationships between organizational power, authority, and management styles. Prerequisite: MGT 309 or consent of instructor. Same as MGT 453. | | |
| I E 460. Evaluation of Engineering Data | 3 cr. | |
| Analysis of engineering systems possessing variability, employing regression, analysis of variance, distribution theory, and experimental design methods. Prerequisite: I E 311 or equivalent. | | |
| I E 466. Reliability | 3 cr. | |
| Application of statistical theory to engineering reliability estimation, reliability improvement, and the analysis of reliability test data. Prerequisite: I E 311 or equivalent. | | |
| I E 467. Discrete-Event Simulation Modeling | 4 cr. | |
| Basic modeling concepts, organizations of simulations, input data analysis, random variate generation, simulation design and analysis, model validation, output analysis, and management of simulations. Differentiated graduate assignments. Prerequisite: I E 311 or equivalent. Same as I E 567. | | |
| I E 468. Advanced Discrete-Event Simulation Applications | 3 cr. | |
| Semester long project involving development and application of advanced simulation skills. Prerequisite: I E 467. Same as I E 568. | | |
| I E 477. Ergonomics in Manufacturing Systems | 3 cr. | |
| Ergonomic analysis applied to manufacturing engineering environment. Covers: task analysis, workplace assessment and design, computer-integrated manufacturing, and legal/regulatory issues in manufacturing task and workplace design. | | |
| I E 478. Facilities Planning and Design | 3 cr. | |
| Plant location methods, total process analysis, process integration, materials handling analysis, and traditional and computerized plant layout methodologies. Prerequisite: I E 316. Corequisite: I E 424. | | |
| I E 479. Integrated Manufacturing | 3 cr. | |
| Automated process planning as a link between CAD and CAM. Emphasis on information flows and modeling concepts, design data analysis, feature recognition and generative planning. Prerequisite: knowledge of a programming language or consent of instructor. Same as I E 579. | | |
| I E 480. Senior Design | 3 cr. (2+3P) | |
| Multi-disciplinary team design project for external clients. Involves semester long activities including major design report and presentation. Prerequisites: senior standing, I E 467. | | |
| I E 482. Concepts in Computer Integrated Manufacturing | 3 cr. (2+2P) | |
| Same as E T 482, M E 482. | | |
| I E 490. Selected Topics | 1-3 cr. | |
| Prerequisite: consent of the head of the department. May be repeated for a maximum of 9 credits. | | |
| I E 505. Directed Readings | 1-3 cr. | |
| Prerequisite: consent of the head of the department. May be repeated for a maximum total of 6 credits. | | |
| I E 511. Survey of Industrial Engineering | 3 cr. | |
| A project-based course covering methods of engineering, plant layout, production and inventory control, and economic analysis. | | |
| I E 515. Stochastic Processes Modeling | 3 cr. | |
| Introduction to the use of stochastic processes in the modeling of physical and natural systems. Use of generating functions, conditional probability and expectation, Poisson processes, random walk models, Markov chains, branching processes, Markov processes, and queuing processes in an applied setting. Prerequisites: I E 311 or equivalent; and MATH 392 or equivalent. | | |
| I E 522. Queuing Systems | 3 cr. | |
| Elements and classification of queuing systems, single server models, multi-server models, cost analysis and applications. Prerequisite: I E 311 or equivalent. | | |
| I E 523. Advanced Engineering Economy | 3 cr. | |
| Theoretical basis for engineering economy methods, problems of cost estimation, replacement, nonmonetary factors, and feasibility studies. Same as C E 523. | | |
| I E 524. Advanced Production and Inventory Control | 3 cr. | |
| Organization and functions of manufacturing planning and control systems including forecasting, MRP, capacity planning, JIT systems, scheduling and inventory control. Same as I E 424 with differentiated assignments. | | |
| I E 525. Systems Synthesis and Design | 3 cr. | |
| Examination of the production management complex in terms of its components and the synthesis of these components into an effective operating unit. Development of input-output models representing the basis structure of all production activities. | | |
| I E 530. Environmental Management Seminar | 1 cr. | |
| Same as C E 530, E E 530, CH E 530. | | |
| I E 531. Fundamentals of Operations Research Techniques | 3 cr. | |
| Key concepts, terminology, paradigms, and methods of operations research: Linear programming including assignment and transportation algorithms; stochastic analysis, including inventory control and queuing systems; general approaches, including goal, integer, nonlinear and dynamic programming. | | |
| I E 533. Linear Programming | 3 cr. | |
| Linear programming problem formulation, simplex algorithm, theory of linear programming, duality, revised simplex algorithm, and sensitivity analysis. | | |
| I E 534. Nonlinear Programming | 3 cr. | |
| Theoretical and computational methods to solve optimization problems in engineering, statistics, economics, and operations research. Topics include convexity, optimality conditions, Newton's method, Lagrange multipliers, search algorithms for unconstrained and constrained problems, as well as barrier and penalty methods. Prerequisite: MATH 192G or equivalent | | |
| I E 535. Discrete Optimization | 3 cr. | |
| Combinatorial Optimization problems using both integer programming and graph theoretic approaches. Emphasis on modeling and computational algorithms. | | |
| I E 537. Large Scale Systems Engineering | 3 cr. | |
| Systems engineering approaches to large-scale complex technological and societal problems. Concepts of interaction and structural graphs, matrices, delta, and Gantt charts. The hall matrix approach, structural concepts, reachability matrices, and cross impact-analysis, modeling and decision making. | | |
| I E 539. Fundamentals of Transportation and Routing in Logistics | 3 cr. | |
| Introduction to the conceptual, methodological, and mathematical foundations of transportation and routing problems in logistics system. Emphasis on mathematical modeling and computational algorithms. | | |
| I E 545. Characterizing Time-Dependent Engineering Data | 3 cr. | |
| Theory and techniques employed in the characterization of stochastic | | |

processes commonly found in engineering applications. Distribution models include exponential, gamma, Weibull, and extreme value. Design and analysis of experiments involving complete and censored data and elevated stress. Analytical techniques include parametric, nonparametric, and graphical approaches with emphasis on modern computer tools. Exact and approximate maximum-likelihood techniques are stressed. Prerequisite: I E 311 or equivalent.

- I E 550. Environmental Management Seminar II 1 cr.
Survey of practical and new developments in hazardous and radioactive waste management provided through a series of guest lectures and reports of ongoing research. Same as WERC 550.
- I E 561. Advanced Safety Engineering 3 cr.
Regulation as well as qualitative, and quantitative methods to achieve and maintain safety in the workplace. Includes liability, worker's compensation, OSHA, hazard control, safety assessment, cost justification, and system analysis. Prerequisite: graduate status in engineering.
- I E 563. Topics in Engineering Administration 3 cr.
Study of qualitative and quantitative aspects. Consideration given to philosophical, psychological, political and social implications of engineering administrative decisions.
- I E 567. Design and Implementation of Discrete-Event Simulation 3 cr.
Basic modeling concepts, organizations of simulations, input data analysis, random variate generation, simulation design and analysis, model validation, output analysis, and management of simulations. Taught with I E 467 with differentiated assignments for graduate students.
- I E 569. Stochastic Simulation Concepts and Techniques 3 cr.
Key computational and stochastic aspects of discrete-event simulation. Topics include selecting and using pseudo random number generators, estimating the value of intractable mathematical expressions, dealing with variation and uncertainty in models, dealing with autocorrelation, determining the precision of simulation results and how to improve simulation efficiency and effectiveness. This course is intended for engineering graduate students with a background in probability, statistics, and design of experiments. While beneficial to graduate students who wish to extend their current abilities in simulation, it presumes no prior knowledge of simulation modeling or simulation languages.
- I E 571. Advanced Quality Control 3 cr.
Advanced topics in quality control and design of experiments for improvement of quality. Prerequisite: I E 311 or equivalent.
- I E 575. Advanced Manufacturing Processes 3 cr.
Covers major process parameters in casting, forming, machining, and joining. Process economics and selection of processes design and interactions. Prerequisite: graduate standing.
- I E 577. Ergonomics in Manufacturing Systems 3 cr.
Ergonomic analysis applied to manufacturing engineering environment. Covers: task analysis, workplace assessment and design, computer-integrated manufacturing, and legal/regulatory issues in manufacturing task and workplace design. Same as I E 477 with differentiated assignments for graduate students.
- I E 579. Integrated Manufacturing 3 cr.
Study of automated process planning as a link between CAD and CAM. Emphasis on information flows and modeling concepts, design data analysis, feature recognition and generative planning. Prerequisite: knowledge of a programming language or consent of instructor. Same as I E 479 with differentiated assignments for graduate students.
- I E 590. Selected Topics 1-3 cr.
Prerequisite: consent of the head of the department. May be repeated for a maximum of 9 credits.
- I E 598. Special Research Programs 1-3 cr.
Individual analytical or experimental investigations. May be repeated for a maximum total of 6 credits. Prerequisite: consent of instructor.
- I E 599. Master's Thesis 0-88 cr.
Thesis.
- I E 610. Topics in Operations Research 3 cr.
Selected topics of current interest, to be designated by subtitle. May be repeated for a maximum of 6 credits.
- I E 620. Topics in Computer Modeling 3 cr.
Selected topics of current interest, to be designated by subtitle. May be repeated for a maximum of 6 credits.
- I E 630. Topics in Engineering Management 3 cr.
Selected topics of current interest, to be designated by subtitle. May be repeated for a maximum of 6 credits.
- I E 690. Selected Topics 1-88 cr.
May be repeated. Prerequisite: consent of department head.

I E 700. Doctoral Dissertation
Dissertation.

0-88 cr.

MECHANICAL AND AEROSPACE ENGINEERING

Department website: <http://mae.nmsu.edu/>
Graduate Program Website: http://mae.nmsu.edu/degree_programs/grad/
(575) 646-3501
tdburton@nmsu.edu

*T.D. Burton, department head, Ph.D. (Penn)-dynamics, nonlinear vibrations; H. Leslie, associate department head, **Ph.D. (Stanford)-heat transfer, renewable energy; E. A. Butcher, Ph.D. (Auburn)-nonlinear dynamics, vibrations, controls, mechanism design; C. Cair, Ph.D. (Michigan)- rarefied gasdynamics, gaskinetic theory and gaskinetic CFD; propulsion, plasmadynamics and space weather, hypersonic flows; V. K. S. Choo, Ph.D. (Liverpool)-composite materials, computer applications; E. G. Conley, ** Ph.D. (Michigan State)-optics, experimental mechanics, design; A. Dobroskok, Ph.D. (St. Petersburg-Russia)- computational micromechanics mechanics; G. V. Garcia, Ph.D. (Texas A&M)-damage detection, experimental mechanics, vibration; J. Genin, ** Ph.D. (Minnesota)-dynamics, vibrations, solid mechanics; H. C. Hardee, ** Ph.D. (Texas-Austin)-electrical interconnections, geophysical instruments; O. Ma, Ph.D. (McGill)- dynamics, control, and robotics; Y.S. Lee, Ph.D. (Illinois Urbana- Champaign)- aeroelastically, fluid-structure interaction, nonlinear system identification; Y. H. Park, Ph.D. (Iowa)-design optimization, computational solid mechanics; A.K. Sanyal, Ph.D. (Michigan)- nonlinear control and estimation, geometric mechanics, control of aerospace vehicles; I. Sevostianov, Ph.D. (St. Petersburg, Russia)-micromechanics of materials, mechanics of biomaterials, mathematical physics; B. N. Shashikanth, Ph.D. (Southern California)-fluid mechanics, dynamical systems, controls; F. Shu, Ph.D. (Purdue)- experimental fluid dynamics, biofluidics and turbulent flow; M. Wei, Ph.D. (Illinois Urbana Champaign)-computational fluid mechanics, aeroacoustics, control and optimization.*

*Registered Professional Engineer (NM)

**Registered Professional Engineer (state other than NM)

DEGREE: Master of Science
MAJOR: Aerospace Engineering

DEGREE: Master of Science in Mechanical Engineering

DEGREE: Doctor of Philosophy
MAJOR: Aerospace Engineering

DEGREE: Doctor of Philosophy
MAJOR: Engineering
CONCENTRATION: Mechanical Engineering

MINOR: Mechanical Engineering

Graduate programs of study are available leading to the degrees of Master of Science and Doctor of Philosophy in Aerospace Engineering, the Master of Science in Mechanical Engineering, and the Doctor of Philosophy in Engineering with a concentration in Mechanical Engineering. Areas of active research in mechanical engineering include the following: experimental fluids with application to wind power, modeling and analysis of machining processes, micro-mechanics and cross property connections, computational mechanics with application to reservoir geomechanics, renewable energy, nonlinear dynamics and vibration, reduced order modeling in multibody dynamics, structural dynamics and fluids, robotics, composite materials and nanomaterials. Areas of active research in aerospace engineering include the following: computational, theoretical and experimental aero-fluids with application to flapping wing propulsion and fluid-structure interaction, aeroelasticity and flutter, space dynamics and control, spacecraft motion estimation, rarefied gasdynamics and space propulsion, ground simulation of reduced gravity environments, structural health monitoring, and unmanned aerial systems. Laboratory facilities supporting graduate research include a large subsonic wind tunnel, a large water channel, a robotics, controls and UAS lab, a reduced gravity simulation lab, a space dynamics and

controls lab, and a composite materials lab. A mechanical testing lab is also available in the College of Engineering.

In addition to fulfilling the basic requirements for admission to the Graduate School, applicants are expected to have an undergraduate degree equivalent to a B.S. in mechanical or aerospace engineering from a university accredited by ABET. Graduate students whose BS degree is in a discipline other than A E or M E will normally be required to take undergraduate courses in M E or A E in order to prepare for graduate course work; such undergraduate preparatory work will be determined by the graduate coordinator on a case by case basis. A candidate for the master's degree can choose one of two options: a thesis option or a course-only option. Both options require a minimum of 30 credits of graduate study.

Doctoral candidates must complete a program of study determined by the student and his or her advisory committee. The student must successfully pass a written qualifying examination (administered during the student's first year of full-time study) and a written and oral comprehensive examination administered after approximately 80 percent of the course work is completed. The student must submit and defend an acceptable dissertation based on independent investigation in a field of study approved by the advisory committee. The requirements for the M.S. and Ph.D. degrees are stated below.

DEGREE: Master of Science

MAJOR: Aerospace Engineering (30 CREDITS)

Students may select one of two options for completing their MS degree. Selection of a particular option must be made during the first semester of study in conjunction with selecting a permanent advisor.

Thesis Option

- M E 570
- At least 18 credits of A E graduate courses (up to six credits of M E graduate courses may be substituted with the approval of the Graduate Coordinator)
- The program of study may include three credits of A E 509 (individualized studies) and/or up to six credits of A E 510 (special topics courses offered formally on a one time basis)
- Publication requirement—refereed conference proceeding accepted or a referred journal article in review by graduation. The M.S. thesis can be a reformatted version of this paper. Exceptions may be made on a case by case basis by the department head.

Coursework Option

- M E 570 and one core course from 4 of the 5 following topic areas:
 - a. Space Dynamics: A E 561 Spacecraft and Attitude Dynamics and Control, A E 562 Astrodynamics
 - b. Aerofluids: A E 552 Gasdynamics, A E 572 Ideal Fluid Aerodynamics, A E 530 Intermediate Fluid Mechanics
 - c. Structural Dynamics and Control: A E 512 Vibrations, A E 566 Aeroelasticity, A E 527 Controls
 - d. Mechanics: M E 502 Elasticity, M E 504 Continuum Mechanics
 - e. Engineering Analysis: M E 580 Numerical Analysis, M E 518 Finite Elements
- Four additional A E courses which may be core courses listed above, research area courses, A E 509, or A E 510. Graduate M E courses may be substituted for A E courses with the approval of the Graduate Program Coordinator.

DEGREE: Master of Science in Mechanical Engineering (30 CREDITS)

Students may select one of two options for completing their MS degree. Selection of a particular option must be made during the first semester of study in conjunction with selecting a permanent advisor.

Thesis Option

- M E 570
- At least 18 credits of M E graduate courses (up to six credits of A E graduate courses may be substituted with the approval of the Graduate Coordinator)
- The program of study may include three credits of M E 509 (individualized studies) and/or up to six credits of M E 510 (special topics courses offered formally on a one time basis)
- Publication Requirement: refereed conference proceeding accepted or a refereed journal article in review by graduation. The MS thesis can be a

reformatted version of this paper. Exceptions may be made on a case by case basis by the department head.

Coursework Option

- M E 570 and one core course from 4 of the 5 following topic areas:
 - a. Solid Mechanics: M E502 Elasticity, M E504 Continuum Mechanics
 - b. Thermal Science: M E503 Thermodynamics, M E540 Intermediate Heat Transfer
 - c. Fluids: M E530 Inter. Fluid mechanics, M E533 Computational fluid mechanics
 - d. Dynamics and Vibrations: M E511 Dynamics, M E512 Vibrations
 - e. Engineering Analysis and Control: M E580 Num. analysis, M E518 Finite element analysis, M E527 Control of mechanical systems
- Four additional M E courses which may be core courses listed above, research area courses, dual listed courses, M E 509, or M E 510. Graduate A E courses may be substituted for M E courses with the approval of the Graduate Program Coordinator.

SELECTION OF MS OPTION AND PERMANENT ADVISOR

Newly admitted graduate students will be assigned a temporary advisor for the first semester, but they must select a degree option and permanent advisor before registering for the second semester.

In considering a decision about option and advisor, the student should arrange to meet with several members of the graduate faculty during the first six weeks of study to discuss specific educational objectives. The student can use these meetings to become familiar with faculty interests and research projects currently in progress. The faculty member must agree (in writing) to serve as the student's advisor.

All students must pass a final examination. The final examination is to be conducted by the student's advisory committee and is taken after completing all coursework and thesis work for the thesis option, or all coursework for the course-only option.

DEGREE: Doctor of Philosophy

MAJOR: Aerospace Engineering

The student's academic program is not judged satisfactory unless it prepares the student to contribute to the advancement of knowledge in the field of Aerospace Engineering. To satisfy this objective, the program must include a minimum of 48 credit hours of approved graduate level course work beyond the Bachelor of Science degree. The Degree of Doctor of Philosophy is indicative of distinguished achievement in the areas of scholarship and original research. Therefore, a dissertation of high quality is required of all doctoral students in Aerospace Engineering. Students must follow the degree requirements listed below to complete the PhD course of study.

- A minimum of 36 credit hours of coursework beyond the Bachelor of Science degree, at least 18 of which must support the student's research area.
- A minimum of 24 credit hours of research, A E 700 - Doctoral Dissertation, which may include a maximum of 6 credit hours of A E 600 Doctoral Research. A E 600 is intended for those students who have not completed the qualification examination, a prerequisite for A E 700.
- A student is required to have one refereed journal paper accepted and a second one accepted or in review by graduation. The PhD dissertation can be a compilation and reformatted version of these published or accepted journal papers. Exceptions may be made on case by case basis by the Department Head.

DEGREE: Doctor of Philosophy

MAJOR: Engineering

CONCENTRATION: Mechanical Engineering

The student's academic program is not judged satisfactory unless it prepares the student to contribute to the advancement of knowledge in the field of Mechanical Engineering. To satisfy this objective, the program must include a minimum of 48 credit hours of approved graduate level course work beyond the Bachelor of Science degree. The Degree of Doctor of Philosophy is indicative of distinguished achievement in the areas of scholarship and original research. Therefore, a dissertation of high quality is required of all doctoral students in Mechanical Engineering. Students must follow the degree requirements listed below to complete the PhD course of study.

- A minimum of 36 credit hours of coursework beyond the Bachelor of Science degree, at least 18 of which must support the student's research area.
- A minimum of 24 credit hours of research, M E 700 - Doctoral Dissertation, which may include a maximum of 6 credit hours of M E 600 Doctoral Research. M E 600 is intended for those students who have not completed the qualification examination, a prerequisite for M E 700.
- A student is required to have one refereed journal paper accepted and a second one accepted or in review by graduation. The PhD dissertation can be a compilation and reformatted version of these published or accepted journal papers. Exceptions may be made on case by case basis by the Department Head.

Ph.D. Program Transfer Credits:

A student who has completed a Master of Science degree in M E, A E, or a closely related field may transfer up to 24 credits of graduate coursework, approved by the student's advisor, into a Ph.D. program of study.

Selection of Permanent PhD Advisor

Newly admitted graduate students will be assigned a temporary advisor for the first semester. The student must select a permanent advisor before registering for the second semester. In selecting a permanent advisor, the student should arrange to meet with several members of the graduate faculty during the first six weeks of enrollment to discuss specific objectives. The student should use these meetings to become familiar with faculty research interests and research projects currently in progress. The faculty member must consent (in writing) to serve as the student's advisor.

Policies governing the PhD written qualifying examination, the PhD written and oral comprehensive examination, the student's PhD committee, and the PhD dissertation are contained in the department's Graduate Program Website.

MECHANICAL ENGINEERING

- M E 452. Introduction to Automation and Control System Design 3 cr. (2+3P)
Control system design and implementation. Emphasis on practical applications of traditional control algorithms to mechanical engineering applications in thermofluid systems and mechanical systems. Design of feedback analog and digital control systems. Introduction to robots and automation. Lab assignments include programming industrial robotic and automation systems.
- M E 460. Applied Finite Elements 3 cr.
Introduction to the practical aspects of structural finite element modeling. Course focuses on providing a working knowledge of how to effectively incorporate finite element techniques into the design process. Prerequisite(s): Senior Standing.
- M E 473. Compressible Flow 3 cr.
Development and application of the principles of compressible flow. Emphasis upon one-dimensional, nonviscous flow. Prerequisites: M E 338, M E 340.
- M E 480. Nuclear Systems 3 cr.
Fundamentals of nuclear energy, systems, design, and analysis. Applications of nuclear energy in power production. Survey of modern nuclear systems. Prerequisite: MATH 192G or consent of instructor.
- M E 481. Alternative and Renewable Energy 3 cr.
Current and future energy needs of the United States and the world will be considered primarily from the standpoint of renewable energy sources such as solar, wind, ocean, and biomass. Technical, economic, and environmental aspects of each technology will be addressed. Prerequisite(s): M E 240, M E 341, and (M E 338 or A E 339).
- M E 487. Mechatronics 3 cr. (2+3P)
Introduction to the analysis and design of computer-controlled electromechanical systems, including data acquisition and conversion, force and motion sensors, actuators, mechanisms, feedback control, and robotic devices. Students required to work in teams to construct and test simple robotic systems. Prerequisites: E E 201, and M E 345.
- M E 502. Elasticity I 3 cr.
Introduction to stress tensor, strain tensor, constitutive law, energy theorems, plane stress and plane strain. Also covers torsion of shafts and propagation of stress waves in elastic solids.
- M E 503. Thermodynamics 3 cr.
A comprehensive study of the first and second laws of thermodynamics, nonequilibrium processes, equations of state, and statistical thermodynamics. Prerequisite: M E 340 or equivalent.
- M E 504. Continuum Mechanics 3 cr.
Basic introduction to the Mechanics of Continuous Media. Its aim is to prepare the student for more advanced courses in Solid and Fluid Mechanics. The topics to be covered include: introduction to Cartesian tensors, tensor algebra and calculus; Lagrangian and Eulerian kinematics; Cauchy and Piola-Kirchhoff stresses; general principles of conservation; constitutive theory for ideal fluids, Newtonian and non-Newtonian fluids, finite and linear elasticity.
- M E 505. Fundamentals of the Theory of Plasticity 3 cr.
Basic concepts in continuum mechanics, equations of the plastic state, equations of elastic-plastic equilibrium, criteria for yielding, initial and subsequent yield surfaces, two-dimensional and axis-symmetric plasticity problems, dynamic problems. Prerequisite(s): M E 502.
- M E 509. Individualized Study 3 cr.
Individualized study covering specialized topics in mechanical and aerospace engineering. Consent of instructor required.
- M E 510. Special Topics 1-6 cr.
Topics in mechanical engineering. May be repeated for a maximum of 6 credits. Prerequisite: consent of the department head.
- M E 511. Dynamics 3 cr.
An advanced study of the dynamical behavior of systems of particles and rigid bodies, with emphasis on the theoretical background of dynamics. Prerequisite: M E 350 or equivalent.
- M E 512. Vibrations 3 cr.
Free and forced vibrations for discrete and continuous systems with single or multiple degrees of freedom. Introduction to nonlinear and random vibration and solution techniques for such systems. Prerequisite: M E 511 or consent of instructor.
- M E 514. Advanced Composite Materials 3 cr.
Study on the anisotropic elasticity, strength of anisotropic materials and micromechanics. Topics from micromechanics and macromechanics through lamination theory and examples of plate bending, buckling and vibration problems. Course taught on an as-needed basis. Prerequisite: consent of instructor.
- M E 515. Non-Destructive Evaluation of Materials 3 cr.
Develop field equations for the propagation of elastic waves in materials. Their application in non-destructive evaluation of materials will be explored. Prerequisite: M E 570
- M E 516. Fracture Mechanics 3 cr.
Brittle fracture of structures, elastic stress analysis of cracked components, elasticity of singular stress fields, stress-field theory of fracture, energy of fracture, static and dynamic failures, elastic-plastic fracture mechanics, fatigue crack growth and life prediction under constant and variable amplitude loading, environmental effects. Prerequisite(s): M E 502.
- M E 517. Nonlinear Dynamics and Chaos 3 cr.
Singular points, periodic solutions, stability, and local bifurcations for ODEs and maps; phase space methods, invariant manifolds, and Poincaré maps; nonsmooth, periodic, time-delay, and Hamiltonian systems; perturbation, averaging, and harmonic balance methods; center manifold reduction and normal forms; strange attractors, Liapunov exponents, attractor dimension; dissipative and Hamiltonian chaos
- M E 518. Finite Element Analysis 3 cr.
Introduction to finite element method. Topics include mathematical modeling, variational formulation, shape functions, truss, beam, solid, and shell elements. Includes static, dynamic, and nonlinear analysis. Prerequisites: M E 329, MATH 392, or consent of instructor.
- M E 520. Micromechanics 3 cr.
The course covers fundamentals of micromechanics: point force solution, Eshelby's problem, various approximate methods to calculate effective material properties of inhomogeneous materials, variational principles of the mechanics of composites. The history of micromechanics is discussed from Navier and Cauchy to current state of the art. Prerequisite(s): M E 502.
- M E 521. Elastic Stability 3 cr.
Elastic stability of discrete and continuous systems, both static and dynamic. Topics include the stability of beams, columns, plates, shells, and composite structures. Physical systems, such as automobiles and airplanes will be considered.
- M E 522. Mechanics of Plates and Shells 3 cr.
Pure bending of plates (Kirchhoff theory); rectangular, circular, and annular plates under lateral loads; various edge conditions; effects of transverse shear deformation; large deflections of plates; theory of thick curved shells; deformations and stresses of cylindrical and conical shells. Prerequisite(s): M E 502.
- M E 523. Dynamic Stability 3 cr.
Develop field equations for discrete and continuous systems through motivational examples. Introduce mathematical theory of stability for both linear and nonlinear systems. Includes Lyapunov's direct methods, linearization

- methods, center manifold theory, normal forms, and topological methods. Consent of instructor required.
- M E 524. Advanced Topics in Mechanics** 3 cr.
Course provides an in-depth introduction to the methods and analysis techniques used in computational solutions of engineering mechanics problems. Numerical formulation and algorithms include: variational formulation and variational constitutive updates, finite element discretization, time integration algorithms and convergence analysis. Projects on finite element procedures in linear and non-linear problems are included. Prerequisite: ME 328, ME 329, MATH 392, or equivalent.
- M E 525. Nonlinear Structural Dynamics** 3 cr.
Modern techniques to analyze and simulate nonlinear dynamical systems that arise in structural dynamics. The course will cover the following topics: summary of linear theory of multi-degree of freedom systems; sources of nonlinearity encountered in structural dynamics; effects of nonlinearity on structural response; nonlinear normal modes; reduced order modeling methods; data analysis methods; and applications from among aeroelasticity, energy pumping, structural health monitoring, system identification, and others.
- M E 526. Robotics** 3 cr.
Introduction to the fundamentals of robotics with emphasis on solutions to the basic problems in kinematics, dynamics, and control of manipulators of serial type. Covers modeling of rigid body motion, kinematics of articulated multibody systems, robot dynamics and simulation, sensing and actuation, robot controls, and task planning. Prerequisites: M E 237 and M E 329 or consent of instructor.
- M E 527. Control of Mechanical Systems** 3 cr.
Rigorous introduction to the control of dynamical systems, with a focus on mechanical systems. Includes basic systems theory, controllability, feedback and stabilization, observers and dynamic feedback, and applications of methods to systems of importance in mechanical engineering. Prerequisite: consent of instructor.
- M E 529. Nonlinear and Optimal Control** 3 cr.
Introduction to optimal control theory, Pontryagin's Maximum Principle, control of simple mechanical systems, Lagrangian and Hamiltonian methods, introduction to geometric control-Lie algebras, distributions, controllability and observability
- M E 530. Intermediate Fluid Mechanics** 3 cr.
Application of exact and empirical solutions to fundamental flow problems, including viscous and inviscid behavior. These applications establish a theoretical basis for the origin and physical role of common terms in the governing equations. Prerequisite: M E 338 or consent of instructor.
- M E 533. Computational and Theoretical Fluid Mechanics** 3 cr.
Application of fluid mechanics theory and computational approaches to advanced flow problems, including viscous/inviscid and laminar/turbulent behavior. Complex flow problems addressed through development of a theoretical formulation, followed by application of computational fluid dynamic (CFD) tools, and finally presentation and validation of solution data. Prerequisite: M E 530 or consent of instructor.
- M E 534. Advance Computational Fluid Dynamics** 3 cr.
Advanced techniques for large-scale numerical simulations of fluid flows: spectral numerical methods, including Fourier and other expansions, Galerkin and collocation projections, computational methods to solve incompressible and compressible Navier-Stokes equations, high-resolution methods for hyperbolic equations with discontinuous solutions, and issues related to implementation on supercomputers. Prerequisite(s): M E 533.
- M E 535. Turbulence and Chaos** 3 cr.
Classical and Computational Fluid Dynamics (CFD) techniques are used to investigate turbulent flows. Chaos and fractals introduced. Prerequisite(s): M E 530.
- M E 536. Hydrodynamic Stability and Turbulence** 3 cr.
Introduction to fundamentals of hydrodynamic stability, classical linear stability analysis of parallel shear flows and rotating flows, nonlinear stability, basic concepts in turbulence theory Prerequisite(s): M E 533.
- M E 537. Vortex Dynamics** 3 cr.
Basic laws of inviscid vortex motion-Helmholtz's laws, Kelvin's circulation theorem. Singular vortex models--point vortices, vortex rings, vortex patches, vortex sheets-with applications to vortex-dominated flows in engineering and nature. Numerical vortex methods Prerequisite(s): M E 533.
- M E 538. Experimental Methods in Fluid Mechanics** 3 cr. (2+3P)
Flow visualization techniques for incompressible and compressible flows, laser-based flow diagnostic methods, i.e., PIV (Particle Image Velocimetry), basic aspects of wind-tunnel design
- M E 540. Intermediate Heat Transfer** 3 cr.
Fundamentals of conduction, convection, and radiation heat transfer. Emphasis on the application of combined heat transfer to the solution of problems not accessible at the undergraduate level. Prerequisites: M E 341 and M E 338, or consent of instructor.
- M E 550. Environmental Management Seminar II** 1 cr.
Survey of practical and new developments in hazardous and radioactive waste management provided through a series of guest lectures and reports of ongoing research.
- M E 570. Engineering Analysis I** 3 cr.
Introduction to engineering analysis with emphasis on engineering applications. Topics include linear algebra, linear ordinary differential equations, and linear partial differential equations with focus on analytical methods. Prerequisite: M E 329 or consent of instructor.
- M E 580. Engineering Analysis II** 3 cr.
Engineering analysis with emphasis on engineering applications. Topics include analytical and numerical methods in linear and nonlinear ordinary and partial differential equations. Prerequisite: M E 570 or consent of instructor.
- M E 598. Special Research Programs** 1-3 cr.
Individual investigations, either analytical or experimental. May be repeated for a maximum of 6 credits.
- M E 599. Master's Thesis** 0-88 cr.
Thesis.
- M E 600. Doctoral Research** 1-88 cr.
This course number is used for assigning credit for research performed prior to successful completion of the doctoral qualifying examination.
- M E 698. Special Research Programs** 1-3 cr.
May be repeated for a maximum of 6 credits.
- M E 700. Doctoral Dissertation** 0-88 cr.
Dissertation.

AEROSPACE ENGINEERING

- A E 509. Individualized Study** 3 cr.
Individualized study covering specialized topics in aerospace engineering. Consent of instructor required. Restricted to AEME majors.
- A E 510. Special Topics** 1-6 cr.
Topics in aerospace engineering. May be repeated for a maximum of 6 credits. Consent of instructor required.
- A E 512. Vibrations** 3 cr.
Free and forced vibrations for discrete and continuous systems with single or multiple degrees of freedom. Introduction to nonlinear and random vibration and solution techniques for such systems. Pre/Corequisite(s): ME 511 or consent of instructor. Crosslisted with: M E 512
- A E 525. Nonlinear Structural Dynamics** 3 cr.
Modern techniques to analyze and simulate nonlinear dynamical systems that arise in structural dynamics. The course will cover the following topics: summary of linear theory of multi-degree of freedom systems; sources of nonlinearity encountered in structural dynamics; effects of nonlinearity on structural response; nonlinear normal modes; reduced order modeling methods; data analysis methods; and applications from among aeroelasticity, energy pumping, structural health monitoring, system identification, and others. Crosslisted with: M E 525
- A E 527. Control of Mechanical Systems** 3 cr.
Rigorous introduction to the control of dynamical systems, with a focus on mechanical systems. Includes basic systems theory, controllability, feedback and stabilization, observers and dynamic feedback, and applications of methods to systems of importance in mechanical engineering. Consent of instructor required. Crosslisted with: M E 527
- A E 529. Nonlinear and Optimal Control** 3 cr.
Introduction to optimal control theory, Pontryagin's Maximum Principle, control of simple mechanical systems, Lagrangian and Hamiltonian methods, introduction to geometric control-Lie algebras, distributions, controllability and observability. Crosslisted with: M E 529
- A E 530. Intermediate Fluid Mechanics** 3 cr.
Application of exact and empirical solutions to fundamental flow problems, including viscous and inviscid behavior. These applications establish a theoretical basis for the origin and physical role of common terms in the governing equations. Pre/Corequisite(s): ME 338 or consent of instructor. Crosslisted with: M E 530
- A E 533. Computational and Theoretical Fluid Mechanics** 3 cr.
Application of fluid mechanics theory and computational approaches to advanced flow problems, including viscous/inviscid and laminar/turbulent behavior. Complex flow problems addressed through development of a theoretical formulation, followed by application of computational fluid dynamic (CFD) tools, and finally presentation and validation of solution data. Pre/Corequisite(s): ME 530 or consent of instructor. Crosslisted with: M E 533

- A E 552. Introduction to Gasdynamics 3 cr.
Topics include gaskinetics, rarefied gasdynamics, collision dynamics; velocity distribution function, finite rate chemical process; thermal non-equilibrium and chemically reacting flows; introduction to quantum and statistical mechanics; Boltzmann equation and the BGK model; moments of the Boltzmann Equation; the Navier-Stokes Equation; the structure of shock waves. Prerequisite(s): Graduate Student Status.
- A E 554. Introduction to Plasmadynamics and Space Weather 3 cr.
Topics include equilibrium neutral gaskinetic theory; Neutral gas interactions: drag, contamination, erosion and glow; Particle Interactions, hypervelocity and shielding theory; Debye length & sheaths, plasma frequencies; Magneto-hydro-dynamics; Radiation theory, solar wind effects, cosmic rays; Plasma Interactions: surface charging, current collection, arcing; Radiation estimations; Solar wind; Magnetosphere. Prerequisite(s): Graduate Student Status.
- A E 561. Spacecraft Attitude Dynamics and Controls 3 cr.
Topics include, rigid body kinematics and spacecraft attitude descriptions including Euler angles, Euler parameters, classical and modified Rodrigues parameters, and stereographic orientation parameters; Wahba's problem, q-method, and QUEST algorithms; torque-free attitude dynamics; motion and stability due to spinning craft and gravity gradient torque; passive and active methods of attitude control; nonlinear regulator and attitude tracking using feedback control laws. Consent of instructor required.
- A E 562. Astrodynamics 3 cr.
Topics include two-body problem, orbit analysis, and classical orbit determination methods; trajectory design and optimization; orbital maneuvers using impulsive or continuous thrust; relative motion and rendezvous; perturbations and Lagrange planetary equations; interplanetary mission design including gravity assists; introduction to the three-body problem, halo orbits, and invariant manifolds in mission design. Prerequisite(s): AE 362 or equivalent.
- A E 564. Flight Dynamics and Stability 3 cr.
Topics include static and dynamic aerodynamic coefficient force and moment modeling; steady flight; equations of motion; longitudinal and lateral stability; coupled motions; nonlinear effects; applications to aircraft and re-entry vehicles. Consent of instructor required.
- A E 565. Statistical Orbit Determination 3 cr.
Theory of batch and sequential (Kalman) filtering as applied to satellite ranging data, including a review of necessary concepts of probability and statistics; orthogonal transformation techniques, square root filtering, and consider covariance analysis. Course work includes a term project that allows students to apply theory to an actual satellite orbit determination problem. Consent of instructor required.
- A E 566. Aeroelasticity 3 cr.
Introduction to aeroelasticity with emphasis on fluid-structure interactions occurring in aircraft. Phenomena considered include flutter/LCD (limit cycle oscillation), buffeting, divergence, and control reversal. Primary emphasis on structural dynamics, with use of simple aerodynamic models. Pre/Corequisite(s): AE 339 and ME 332 or equivalents recommended.
- A E 575. Propulsion 3 cr.
Thermodynamics and dynamics of air breathing aircraft power plants; engine performance; off-design equilibrium running of turbojet engines; centrifugal compressors; jet, rocket, and ramjet engines; elective propulsion principles and devices for space vehicles.
- A E 598. Special Research Programs 1-3 cr.
Individual investigations, either analytical or experimental. May be repeated for a maximum of 6 credits. Restricted to AEME majors.
- A E 599. Master's Thesis 0-88 cr.
Thesis. Graded: Thesis/Disertation.
- A E 600. Doctoral Research 1-88 cr.
This course number is used for assigning credit for research performed prior to successful completion of the doctoral qualifying examination. Graded: Thesis/Disertation.
- A E 698. Special Research Programs 1-3 cr.
May be repeated for a maximum of 6 credits.
- A E 700. Doctoral Dissertation 0-88 cr.
Dissertation. Graded: Thesis/Disertation.

COLLEGE of EXTENDED LEARNING

Interim Dean and Associate Vice Provost • *Roberta Derlin*

Academic Program Coordinator • *Kelley S. Hestir*

Academic Advisor • *Jimi Ickes*

The College of Extended Learning extends New Mexico State University's reach beyond traditional campuses, classrooms, and academic programs to provide a wide range of educational opportunities for students to meet their academic, professional, and personal learning goals.

Distance Education at NMSU is designed to serve students who live a significant distance away from the main campus or have scheduling conflicts due to family or work obligations and who find distance education the best solution to educational advancement. Distance education graduate degree programs at NMSU are delivered using both technology and face-to-face instruction at off-site locations such as NMSU community college campuses. For a complete degree list and more information, visit the Distance Education website at <http://distance.nmsu.edu>.

The College of Extended Learning also provides educational and partnership opportunities for faculty and staff in the University community through training, networking, and mentoring. The College of Extended Learning is located in Milton Hall, room 185. Contact by calling (575) 646-8231 or (800) 821-1574, or <http://extended.nmsu.edu/contact>. For current information visit <http://extended.nmsu.edu/>

DISTANCE EDUCATION

The College of Extended Learning provides comprehensive distance learning opportunities to meet diverse educational and professional needs anytime, anywhere. Distance education courses from NMSU are delivered using the most innovative technology and methods available, including web-based technologies, ITV (Interactive Television), faculty exchanges, and off-site classes. Degree programs include masters' degrees and doctorates.

Students who wish to take Distance Education courses offered by NMSU for graduate credit must be admitted to the Graduate School prior to enrollment in the class. To receive credit for these courses registration at the NMSU Graduate School is required.

NMSU STUDENT LEARNING OUTCOMES ASSESSMENT

Students enrolled in the College of Extended Learning will participate in NMSU's Student Learning Outcomes Assessment program as required.

PROGRAMS OFFERED THROUGH DISTANCE EDUCATION

NMSU's distance education programs are designed to serve students who may not be able to pursue an education through traditional means, and include certificate and licensure programs, graduate masters' and doctoral programs. In some cases, brief residencies on the NMSU Las Cruces campus may be a requirement of the program. See "College of Extended Learning: Distance Education" in the General Information chapter of this catalog or visit <http://distance.nmsu.edu/degrees/index.cfm> for a complete listing of programs.

Graduate courses are offered at various locations and through different delivery channels by members of the NMSU faculty. Such courses are conducted according to the same standards as those offered on the campus. All rules and regulations pertaining to graduate study apply equally to students at these locations and to the graduate students in residence on the campus. Special examinations, such as department qualifying examinations conducted before admission to candidacy and final examinations for master's degree candidates, must be taken under the supervision of NMSU faculty.

COLLEGE OF EXTENDED LEARNING- GRADUATE CERTIFICATE IN ONLINE TEACHING AND LEARNING (OTL)

The College of Extended Learning offers the graduate certificate in Online Teaching and Learning, a one or two-year program consisting of five 3-credit

courses that culminates in an online teaching practicum. The certificate program is designed for higher education or K12 educators, corporate or military trainers, education and training consultants, or professional development service providers interested in developing formal online teaching environments. Students will design and develop an online course in the subject area of their choice, providing them with the opportunity to learn general, and subject-specific, online teaching and learning principles and strategies. Courses are delivered via Blackboard with several synchronous and face-to-face meetings throughout the year. The certificate program courses also apply towards the Master of Arts in Teaching (MAT) offered by the College of Education's Department of Curriculum and Instruction in collaboration with the College of Extended Learning.

TEACHING ACADEMY

The Teaching Academy supports teachers, enhances learning, and builds community by providing training, networking, and mentoring to all NMSU educators. The Academy provides workshops and short courses on teaching, time management, mentoring, scholarly writing, and other topics, as well as trips to teaching conferences. The Teaching Academy is located in room 50, Milton Hall. Detailed information is available at <http://www.teaching.nmsu.edu>, by telephone at (575) 646-2204, or through email at teaching@nmsu.edu.

ONLINE COURSE IMPROVEMENT PROGRAM

The Online Course Improvement Program provides main campus faculty with a variety of free faculty services and options for discounted external services that focus on improving the quality of online teaching and learning. This program compliments services currently available through The Teaching Academy and Instructional Innovation and Quality. Services include online course consultations and reviews, workshops and webinars, a resource center for online teaching and learning, and a professional development program for faculty who want to commit to a one-year facilitated program.

TECHNOLOGY-BASED PROGRAMS

Distance education programs listed under this category are delivered primarily using distance learning technologies. In some cases, programs may require brief residencies on the main campus for orientation, assessment, or other activities. Technologies used to deliver distance education at NMSU include:

- Blackboard: enabling instructors to utilize the Internet in the delivery of a course
- Adobe Connect: a synchronous Web delivery solution for conducting virtual or "live" classroom events through the Web
- NMSU Media Services: provides course delivery through cable television, satellite, teleconferencing, and more

Courses may use a "blended approach" to instruction by integrating two or more types of technologies shown above to promote engaging and effective learning.

MEDIA TECHNOLOGIES

Media Technologies facilitates two-way video conferencing for meetings and distance education courses. In addition, services are available for voice-over IP, audio and video duplication, standards conversions, field and studio videotaping, editing, and course delivery through cable television, satellite, teleconferencing, and more. Courses at NMSU may use a blended approach to instruction that integrates two or more types of these technologies to promote engaging and effective learning.

WEEKEND COURSES

For students who find it difficult or impossible to take classes during the week because of work or family responsibilities, the College of Extended Learning offers regular, full-credit courses taught weekly on Friday evening, Saturday, and Sunday at the Las Cruces campus.

Courses are available for anyone wanting to start or return to college and for those wishing to take courses for personal enrichment. Detailed information is available at <http://www.nmsu.edu/weekend> or by telephone at (575) 646-5837 or (800) 821-1574.

OFF-SITE/EXTENSION PROGRAMS

Distance education programs listed under this category are delivered primarily face-to-face at off-site/extension locations. Often, these courses use technology to enhance instruction and learning. Programs are located at NMSU branch campuses and other locations throughout the state. The degree programs below are organized according to location of delivery. For more information visit <http://extended.nmsu.edu/> and <http://distance.nmsu.edu>

NMSU-Alamogordo

Graduate Licenses

- College of Education
 - Post-B.A. Elementary Licensure

NMSU-Carlsbad

Graduate Licenses

- College of Education
 - Post-B.A. Elementary Licensure

NMSU-Grants

Graduate Certificates and Licenses

- College of Education
 - Post-B.A. Elementary Licensure

Albuquerque

Master's Degrees

- College of Arts and Sciences
 - Master of Criminal Justice (MCJ)
- College of Education
 - Doctorate in Educational Leadership (Ed.D)
- College of Engineering
 - Master of Science in Industrial Engineering
- College of Health and Social Services
 - Master of Social Work (MSW)
 - Master of Public Health (MPH)

Los Alamos National Lab

Master's Degrees

- College of Business
 - Master of Business Administration

Sandia National Lab

Master's Degrees

- College of Business
 - Master of Business Administration

White Sands Missile Range

Master's Degrees

- College of Business
 - Master of Business Administration

CEL- ONLINE TEACHING/LEARNING

- CEL 495. Directed Studies 1-6 cr.
Individual study directed by consenting faculty. Consent of instructor required.
- CEL 498. Degree Capstone 3 cr.
A final academic project reflecting BAS/BIS career; study plans and reflections on degree completion experience.
- CEL 499. Internship 1-6 cr.
Placement experience for BAS/BIS students to participate in career oriented academic and professional level opportunities. Consent of instructor required.
- CEL 560. Fostering Online Learning Communities 3 cr.
Examines theoretical and practical aspects of communication and collaboration and their impact on the formation of online learning communities for those teaching adults in higher education, business, or government settings.
- CEL 570. Designing and Organizing Online Learning Environments 3 cr.
Explores the theories, models, approaches, technologies, and methods of online teaching and adult learning. Provides a foundation for examining the roles and characteristics of the online teacher and learner for those teaching adults in higher education, business, or government settings. Prerequisites: CEL 560
- CEL 571. Design and Delivery of Webconferences and Webinars 3 cr.
This course provides hands-on experiences with web conferencing and examines the theory and research of webconferencing's impact on teaching and learning. Consent of instructor required.
- CEL 580. Tools and Techniques for Online Teaching 3 cr.
Examines the theoretical and practical implications of various asynchronous and synchronous tools and their impact on teaching and learning through research and hands-on experience. Prerequisites: CEL 570
- CEL 581. Emerging Technology Tools and Techniques 3 cr.
This course examines the theory, research, and practice of emerging technologies for educational practice and their impact on online teaching and learning. Prerequisite(s): CEL 580 Tools and Techniques for Online Teaching, or equivalent course.
- CEL 590. Assessing and Evaluating Online Learning 3 cr.
Explores a variety of online assessment and evaluation options with an emphasis on continual assessment and evaluation to improve teaching and learning. Prerequisites: CEL 580
- CEL 595. Directed Studies 3 cr.
Supervised academic work. Prerequisites: Consent of Instructor

COLLEGE of HEALTH and SOCIAL SERVICES

Dean • *Tilahun Adera*
Associate Dean for Academic Affairs • *Donna Wagner*
Interim Associate Dean for Research • *Michael Young*
Administrative Assistant Intermediate/Student Records • *Jane Boykin*
Senior Program Specialist • *Robert Nosbisch*

HEALTH SCIENCE

Department Website: <http://publichealth.nmsu.edu>
(575) 646-4300
Mark J. Kittleson, PhD, FAAHB, FAAHE, department head
kittle@nmsu.edu

T.Adera, Ph.D. (Oregon State U.)- epidemiology; S.D. Arnold, Ph.D. (Colorado State U.) – environmental and occupational health; J.E. Brandon, Ph.D., C.H.E.S. (Southern Illinois U.) – border health issues, community health education, health-related behavior change, problem-based learning, rehabilitation; S. Forster-Cox, Ph.D. (U. of New Mexico) – community health education, health promotion, non-profit organizations, rural health; M.J. Kittleson, Ph.D., FAAHB, FAAHE (U of Akron)- health education, technology, evaluation, biostatistics; C. T. Kozel, Ph.D., C.H.E.S. (U. of New Mexico)-community health education, health policy analysis, administration; C. Kratzke, Ph.D., C.H.E.S. (Old Dominion U.)-community health education, health disparities, cancer; R. Palacios, Ph.D. (U. of Texas at El Paso)-stress, disease outcomes, program evaluation; S. P. Rao, Ph.D. C.H.E.S. (Texas Women’s U.)-domestic violence, HIV/AIDS, addictions, community health education; J. Robinson III, Ed.D., FAAHE (U. of Northern Colorado) - health education; S.L. Wilson, Ph.D. (Southern Methodist U.)- health policy and administration, anthropology and public health, rural health, international health, health disparities; M. Young, Ph.D. FAAHB, FAAHE, FASHA, FSSSS(Texas A&M)- health education sexuality issues;

DEGREE: Master of Public Health

MINOR: Alcohol and Drug Counseling (interdisciplinary)
MINOR: Environmental and Occupational Health
MINOR: Gerontology
MINOR: Public Health
MINOR: US/Mexico Border Health Issues

The Department of Health Science offers the Master of Public Health degree (M.P.H.) in community health education, designed to prepare public health professionals in the breadth of public health practice while also including in-depth preparation in community health education. The degree program prepares public health professionals to function in a variety of settings, including health programs at the local, state, and federal government levels; profit and nonprofit organizations and agencies; worksite settings; and educational institutions. The MPH program is accredited by the Council on Education for Public Health (CEPH).

ADMISSIONS REQUIREMENTS

Students may be admitted on a full-time or part-time basis to the on-campus program or in the fully online version of the program, which is delivered via distance education technologies. The online program has curriculum and degree requirements in common with the on-campus program, and is covered by the same CEPH accreditation. All coursework for the online degree can be completed off-campus utilizing web-based technologies and is aimed at meeting the needs of working students and others for whom a campus-based program is not an option. In addition to meeting all admissions requirements of the Graduate School, applicants must meet the following departmental requirements:

- Have completed a minimum of 6 semester credits in social and behavioral sciences, 3 semester credits in statistical methods, 4 semester credits in biology or a related field, and 3 semester credits in a foundations of public health course, or agree to successfully complete MPH 500 within the first

year. Students who lack any of these requirements may have to complete make-up course work prior to being fully admitted to the program.

- Complete a short bio-sketch and an essay describing the applicant’s reasons for wishing to pursue the M.P.H. degree at NMSU. Any paid or volunteer work performed in a public health or related agency setting should also be described in detail, including length of work and descriptions of the work typically performed as part of the job.
- Scores from a recent administration of the GRE are required (verbal, quantitative, and analytical writing scores).
- Submit at least two letters of reference from former faculty and/or employers.

Admissions information and the departmental application forms may be requested by writing the M.P.H. Program Coordinator, Department of Health Science, MSC 3HLS, NMSU, P.O. Box 30001 Las Cruces, NM 88003-8001 or obtained via the website: www.nmsu.edu/~hlthdpt.

MPH PROGRAM REQUIREMENTS (REQUIRED OF ALL MPH STUDENTS)

I. Public Health Core Courses (18 credits)

MPH 500, Orientation to Public Health	3
MPH 510, Community and Psychosocial Aspects of Public Health	3
MPH 520, Biostatistical Applications in Public Health	3
MPH 530, Epidemiological Approaches to Disease Control and Prevention	3
MPH 540, Health Services System: Administration and Organization	3
MPH 550, Environmental Public Health Issues	3

II. Community Health Education Core Courses (15 credits)

MPH 570, Foundations of Public Health Education	3
MPH 572, Techniques of Health Communication/Education	3
MPH 573, Community Organization in Public Health	3
MPH 574, Program Planning, Evaluation, and Research	3
MPH 579, Research and Resources in Community Health	3

III. Cultural Foundation Course (3 credits)

Select one course from the cultural foundation series numbered MPH 560- MPH 569

IV. Additional Requirements (4 credits)

MPH 596, Field Experience	3
MPH 597, Graduate Public Health Seminar	1

V. Thesis and Non-thesis Options

Choose one of the following options in consultation with your graduate adviser.

Thesis Option

MPH 599, Master’s Thesis	4-6
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Non-thesis Option

Elective	3
Elective	3
Elective	3

Note: Elective courses may include other MPH courses or 500-level courses from other departments. Some MPH courses are crossed listed with HLS 400 level courses (e.g HLS 467 Rural Health Issues and MPH 567 Rural Health Issues). Students who have previously taken one of these 400 level

courses at NMSU, may not take the corresponding 500 level MPH course for degree completion credit.

The thesis option requires a total of 44-46 credit hours, while the non-thesis option requires 49 credit hours. Final examination for the non-thesis option includes both oral and written questions pertaining to the student's graduate course work. Final examination for the thesis option consists of an oral defense of the thesis and related course work.

Selected elective and option courses may also be available during summer sessions. Those MPH students who can document to the satisfaction of the MPH program coordinator that they have completed the equivalent of one year's full-time, either paid or volunteer work in a public health or closely related health agency may petition the student's faculty advisor, MPH program coordinator, and department head to substitute 2 of the 3 credits of MPH 596 Field Experience with 2 credits of elective coursework.

All MPH students must comply with the Student Code of Conduct for the Department of Health Science.

GERONTOLOGY

- GERO 450. Health Promotion for the Older Adult 3 cr.
Common health concerns and lifestyle issues relevant to older adults. Facts about the content area, health behaviors, and practices to promote health and prevent disease; program development strategies applicable to a variety of settings. Same as MPH 557.
- GERO 451. Aging and Public Policy 3 cr.
Exploration of public policies relating to elders, historical development, current status and trends in public policy for this age group. Impact of political behavior of elders on policy making and implementing processes.
- GERO 456. Biological Aspects of Aging 3 cr.
Aging, the developmental process of the body determined by cellular changes influenced by lifestyle, genetics, and environment. Investigates these changes, how health promotion influences them, and when they are considered a disease. Same as MPH 556.
- GERO 493. Adulthood and Aging 3 cr.
Normal transitions in later life; those occurring from 40 years of age to the end of life are discussed. Changes in interpersonal relationships and adaptations commonly made by individuals and meeting those alterations are presented through research findings, case studies, and autobiographies. Same as MPH 593.
- GERO 494. Aging in a Multicultural Society 3 cr.
Study and comparison of aging in the southwestern multicultural society with emphasis on health care. Same as MPH 594.
- GERO 495. International Aging and Intellectual Disabilities 3 cr.
Graduate course for policy planners and staff trainers working in the field of Intellectual Disabilities. The course content will be relevant to service provision in developed and developing countries with emphasis on diverse cultures. The consequences of increased longevity for both social and health provision and family careers are covered.
- GERO 498. Independent Study 1-3 cr.
Individual studies with prior approval of health science department head. Prerequisite: senior standing and consent of instructor. May be repeated for maximum of 6 credits.

HEALTH SCIENCE

- HL S 450. Epidemiology 3 cr.
Epidemiologic approaches to disease prevention and control. Factors influencing health status. Restricted to C HL, E S and HNFS majors. Crosslisted with: E S 450
- HL S 451. Biometrics and Health Research 3 cr.
Critical analysis of community health research and related methodologies. Prerequisite(s): E ST 311G. Restricted to C HL majors.
- HL S 452. Environmental Health 3 cr.
Introduction to environmental health designed to address public health issues. Prerequisite(s): Junior or Senior standing. Restricted to C HL, HNFS and E S majors. Crosslisted with: E S 454
- HL S 453. Occupational Health 3 cr.
Identification, control, and prevention of occupational diseases and injuries. Prerequisite(s): Junior or Senior standing. Restricted to C HL and E S majors. Crosslisted with: E S 455
- HL S 454. Environmental Epidemiology 3 cr.
Covers thematic and research aspects, as well as methodological issues related to environmental health and epidemiology, along with international and national priorities. Prerequisites: HL S 450 and HL S 452.

- HL S 457. Administration of Health Programs 3 cr.
Covers administrative responsibilities, organizational theory, strategic planning, and systems theory as applied to the administration of a variety of health programs. Prerequisite(s): HL S 395 or HL S 450, or consent of instructor. Restricted to C HL majors.
- HL S 458. Public Health Resources and Policy Analysis 3 cr.
Covers issues related to U.S.-health policy and allocation of resources. Examination of local, state, and federal public health and health care funding. Assessment of impact of health policy on health education, medical practice, and the workplace. Prerequisite: HL S 457 or consent of instructor. Same as MPH 558.
- HL S 459. Infectious and Noninfectious Disease Prevention 3 cr.
History, etiology, and prevention of diseases affecting humans. Taught with MPH 559. Prerequisite(s): HL S 395 or HL S 470. Restricted to C HL majors.
- HL S 460. American Indian Health 3 cr.
Critical health issues facing American Indians in the contemporary world. Course included in the undergraduate American Indian Program minor.
- HL S 461. Health Disparities: Determinants and Interventions 3 cr.
Investigates: descriptions of health disparities and measurement issues; physical environmental factors, behavioral and emotional variables; impact of aging of the populations, increased racial and ethnic diversity, and technological developments; intervention strategies and evaluation results. Same as MPH 561.
- HL S 462. Hispanic Health Issues 3 cr.
Cultural differences that aid or hinder communication with Hispanic clients and the application of cross-cultural communication skills. Some field trips may be required. Same as MPH 562.
- HL S 464V. Cross-Cultural Aspects of Health 3 cr.
An examination of health practices from a variety of cultural perspectives: communication, observation, research, and assimilation. Issues to be addressed will be examined from a number of viewpoints, such as individual, family, community, and professional roles.
- HL S 465. International Health Problems 3 cr.
Comparison of domestic health programs and problems with those in other parts of the world; emphasis on political parameters and delivery processes. Additional attention is focused on the health issues of the U.S.-Mexico border. Prerequisite: HL S 395 or consent of instructor. Same as MPH 565.
- HL S 466. International Health Practicum 1-3 cr.
Intensive examination of health practices and beliefs from a cultural perspective. Focus on health structure, index of diseases, morbidity, mortality and epidemiological approaches to planning. Required travel (personal travel, lodging, and related expenses are extra). Same as MPH 566.
- HL S 467. Rural Health Issues 3 cr.
Comprehensive overview of rural health services with Southwestern United States and New Mexico focus. Prerequisite: HL S 395. Same as MPH 567.
- HL S 468. Coping with Loss and Grief: A Cross-Cultural Perspective 3 cr.
A cross-cultural perspective to death, loss and grief. Hospice philosophy of caring for the dying will be included. Same as MPH 568.
- HL S 469. U.S.-Mexico Border Health Issues 3 cr.
Interdisciplinary analysis of the impact of living conditions and health issues of communities along the U.S.-Mexico border and of the strategies and initiatives to address these issues. Problem-based learning, case analysis, lecture, guest speakers, Web-CT based instruction, and field trips. Same as MPH 569.
- HL S 471. Resources and Computer Applications in Health Education 3 cr.
Health risk appraisal testing and other software applications, information retrieval systems, on-line database literature searches, and other resource identification methodologies. Taught with MPH 571. Prerequisite(s): HL S 395 or consent of instructor. Restricted to C HL majors.
- HL S 473. Health Program Planning 3 cr.
Planning and development of community health education interventions for behavior change at the individual, family, social network levels of practice. Emphasis on applying program-planning models and designs into a grant-writing project. Restricted to C HL majors.
- HL S 475. Methods of Community Health Education 3 cr.
Responsibilities of health educators, analysis of social forces affecting health needs, application of wide range of health education methods and instructional media, and program implementation skills. Taught with MPH 575. Prerequisite(s): HL S 275. Restricted to C HL majors.
- HL S 476. Theoretically-Based Interventions 3 cr.
Identifying and developing interventions to problematic health-related behaviors. Taught with MPH 576. Prerequisite(s): HL S 473. Restricted to C HL majors only.

- HL S 478. Health Program Evaluation and Research 3 cr.
Covers the application of research and evaluation models for decision-making program and policy development of community health education interventions. Focus on the individual, family, and social network levels of practice. Prerequisite: HL S 473. Restricted to community health majors. Same as MPH 578.
- HL S 480. Communicable Disease Control 3 cr.
Provide an understanding of the microbiology of pathogenic organisms and a public health approach to the control of disease. Instruction through WebCT. Taught with MPH 580.
- HL S 484. Alcohol and Drug Prevention and Control 3 cr.
Drug and alcohol prevention and control strategies will be presented and applied to rural and border communities in southern New Mexico. Some field trips will be required. Prerequisite: HL S 300 or HL S 395 or consent of instructor. Same as MPH 584.
- HL S 486. Special Topics 3 cr.
Specific subjects to be announced in the Schedule of Classes. May be repeated for a maximum of 12 credits. Same as MPH 586.
- HL S 490. Independent Study 1-6 cr.
Individual studies with prior approval of department head. Maximum of 12 credits. Prerequisites: consent of instructor.
- HL S 491. Mind-Body Health and Complementary and Alternative Medicine 3 cr.
An examination of the multiple dimensions of health from international and cultural views, mind-body interaction, and health promotion assessment and intervention techniques. Same as MPH 591.
- HL S 492. Health Care of the Aged 3 cr.
General concepts and principles of aging. Introduces students to the aging process and assists them in understanding the various aspects of growing old. Same as MPH 592.
- HL S 496. Community Health Education Field Experience 1-6 cr.
Senior-standing community health education majors will integrate and apply various concepts related to actual community health education practice. Experience aims to prepare students to integrate the competencies and responsibilities of community health education. Approximately 55 hours at field agency required per credit hour. May be repeated for a maximum of 6 credits. Consent of instructor required. Prerequisite(s): HL S 475 or concurrent enrollment. Corequisite(s): HL S 497. Restricted to C HL majors.
- HL S 497. Senior Seminar in Community Health Education 1 cr.
Critical analysis of issues in CHE and health care. Readings focus on social, economic, cultural, and political issues as they affect the profession and practice. Emphasis on future, local, national, and international health trends. Prerequisite(s): HL S 475 or consent of instructor. Corequisite(s): HL S 496. Restricted to C HL majors.
- HL S 499. Problems in Health Education 3 cr.
Provides opportunity for synthesis of program planning, implementation, and evaluation methodologies in the preparation and delivery of health education topics. Some field trips will be required. Prerequisite(s): Either HL S 395, HL S 478, HL S 476, or consent of instructor. Restricted to C HL majors.

MASTER OF PUBLIC HEALTH

- MPH 500. Orientation to Public Health 3 cr.
Introduction to the historical and contemporary perspectives of public health theory and practice. Includes an investigation of public health as a discipline, a profession, and the programmatic attempts to improve health status.
- MPH 510. Community and Psychosocial Aspects of Public Health 3 cr.
Social, behavioral, and educational aspects of disease prevention and health promotion programs. Restricted to MPH majors.
- MPH 515. Introduction to Gerontology 3 cr.
Social, psychological, and physiological aspects of aging with an interdisciplinary emphasis on health promotion. Demographic characteristics of the aging population. Same as GERO 415.
- MPH 520. Biostatistical Applications in Public Health 3 cr.
Quantitative methods for public health students including tabular, graphical, and numerical descriptive methods, random sampling, principles of statistical inference, confidence intervals, statistical tests of hypothesis through analysis of variance and regression. Restricted to MPH majors.
- MPH 530. Epidemiological Approaches to Disease Control and Prevention 3 cr.
Basic epidemiological principles applicable to infectious and noninfectious disease. Descriptive techniques and analytic designs, and application of statistical and epidemiological investigation methods included. Restricted to MPH majors.
- MPH 540. Health Services System: Administration and Organization 3 cr.
This course focuses on using a systems approach to identify and analyze factors and interrelationships that influence the operation of health ser-

vices organizations. Specific attention is to administrative structures and operations, finance and quality among public health departments, hospitals, multi-institutional systems, integrated health systems and strategic alliances. Restricted to MPH majors.

- MPH 550. Environmental Public Health Issues 3 cr.
Environmental health issues from a public health perspective. Restricted to MPH majors.
- MPH 553. Occupational Health 3 cr.
Identification, control, and prevention of occupational diseases and injuries. Field trips outside of class will be scheduled.
- MPH 554. Environmental Epidemiology 3 cr.
Covers thematic and research aspects, as well as methodological issues related to environmental health and epidemiology, along with international and national priorities. Prerequisites: MPH 530 and MPH 550. Same as HL S 454 with differentiated assignments for graduate students.
- MPH 556. Biological Aspects of Aging 3 cr.
Aging - the developmental process of the body determined by cellular changes influenced by lifestyle genetics, and environment. Investigates these changes, how health promotion influences them and when they are considered a disease. Same as GERO 456.
- MPH 557. Health Promotion for the Older Adult 3 cr.
Common health concerns and lifestyle issues relevant to older adults. Facts about the content area, health behaviors, and practices to promote health and prevent disease; program development strategies applicable to a variety of settings. Same as GERO 450.
- MPH 558. Public Health Policy Analysis 3 cr.
Covers issues related to U.S.-health policy and allocation of resources. Examination of local, state, and federal public health and health care funding. Assessment of impact of health policy on health education, medical practice, and the workplace. Same as HL S 458. Prerequisite: MPH 540 or consent of instructor.
- MPH 559. Infectious and Noninfectious Disease Prevention 3 cr.
History, etiology, and prevention of diseases affecting humans. Prerequisite: HL S 395 or HL S 470. Same as HL S 459 with differentiated assignments for graduate students.
- MPH 560. American Indian Health 3 cr.
Critical health issues facing American Indians in the contemporary world. Same as HL S 460.
- MPH 561. Health Disparities: Determinants and Interventions 3 cr.
Investigates: descriptions of health disparities and measurement issues; physical environmental factors, behavioral and emotional variables; impact of aging of the populations, increased racial and ethnic diversity, and technological developments; intervention strategies and evaluation results. Same as HL S 461.
- MPH 562. Hispanic Health Issues 3 cr.
Cultural differences that aid or hinder communication with Hispanic clients and the application of cross-cultural communication skills. Some field trips may be required. Same as HL S 462 with differentiated assignments for graduate students.
- MPH 563. Interdisciplinary Seminar 3 cr.
Problem-based approach to case study analysis designed to instill a broader appreciation of health issues and multidisciplinary collaboration. May be repeated for a maximum of 6 credits under different subtitles. Same as CHSS 463, HL S 463 with differentiated assignments for graduate students.
- MPH 565. International Health Problems 3 cr.
Comparison of domestic health programs and problems with those in other parts of the world; emphasis on political parameters and delivery processes. Additional attention is focused on the health issues of the U.S.-Mexico border. Same as HL S 465 with differentiated assignments for graduate students.
- MPH 566. International Health Practicum 1-3 cr.
Intensive examination of health practices and beliefs from a cultural perspective. Focus on health structure, index of diseases, morbidity, mortality and epidemiological approaches to planning. Required travel (personal travel, lodging, and related expenses are extra). Same as HL S 466 with differentiated assignments for graduate students.
- MPH 567. Rural Health Issues 3 cr.
Comprehensive overview of rural health services with southwestern United States and New Mexico focus. Prerequisite: HL S 395 or MPH 500. Taught with HL S 467.
- MPH 568. Coping with Loss and Grief: A Cross-Cultural Perspective 3 cr.
A cross-cultural perspective to death, loss and grief. Hospice philosophy of caring for the dying will be included. Same as HL S 468 with differentiated assignments for graduate students.

MPH 569. U.S.-Mexico Border Health Issues	3 cr.
Interdisciplinary analysis of the impact of living conditions and health issues of communities along the U.S.-Mexico border and of the strategies and initiatives to address these issues. Problem-based learning, case analysis, lecture, guest speakers, Web-CT based instruction, and field trips. Same as HL S 469.	
MPH 570. Foundations of Public Health Education	3 cr.
Social, behavioral, and educational aspects of disease prevention and health promotion. Includes history and theoretical basis of health education. Prerequisite: MPH 510. Restricted to MPH majors.	
MPH 571. Microcomputer Applications in Health Education	3 cr.
Health risk appraisal testing and other software applications, information retrieval systems, on-line database literature searches, and other resource identification methodologies. Same as HL S 471 with differentiated assignments for graduate students.	
MPH 572. Techniques of Health Communication/Education	3 cr.
Application of a wide range of communication and education theories/methods, including program planning and evaluation, in public health programming. Prerequisite: MPH 570. Restricted to MPH majors.	
MPH 573. Community Organization in Public Health	3 cr.
Strategies for identifying and involving community leaders, community needs assessment, small area analysis and planning, and community-level development strategies. Prerequisite: MPH 570. Restricted to MPH majors.	
MPH 574. Program Planning, Evaluation, and Research	3 cr.
Covers process of successful public health education program planning and evaluation, research methods, and grant writing. Prerequisite: MPH 570. Restricted to MPH majors.	
MPH 575. Methods of Community Health Education	3 cr.
Responsibilities of health educators, analysis of social forces affecting health needs, application of wide range of health education methods and instructional media, and program implementation skills. Prerequisites: MPH 570 or concurrent enrollment. Taught with HL S 475.	
MPH 576. Theoretically-Based Interventions	3 cr.
Identifying and developing interventions to problematic health-related behaviors. Prerequisite: MPH 570. Taught with HL S 476.	
MPH 579. Research and Resources in Community Health	3 cr.
Exploration of available public health research studies, data, results and implications. Prerequisite(s): MPH 520. Restricted to MPH majors.	
MPH 580. Communicable Disease Control	3 cr.
Provides an understanding of the microbiology of pathogenic organisms and a public health approach to the control of disease. Instruction through WebCT. Taught with HL S 480.	
MPH 584. Alcohol and Drug Prevention and Control	3 cr.
Drug and alcohol prevention and control strategies applied to rural and border communities in southern New Mexico. Some field trips will be required. Same as HL S 484 with differentiated assignments for graduate students.	
MPH 586. Special Topics	3 cr.
Specific subjects to be announced in the Schedule of Classes. May be repeated for a maximum of 12 credits. Taught with HL S 486.	
MPH 590. Independent Study	1-6 cr.
Individual studies with prior approval of department head. May be repeated for a maximum of 6 credits.	
MPH 591. Mind-Body Health and Complementary and Alternative Therapies	3 cr.
An examination of the multiple dimensions of health from international and cultural views, mind-body interaction, and health promotion assessment and intervention techniques. Same as HL S 491 with differentiated assignments for graduate students.	
MPH 592. Health Care of the Aged	3 cr.
General concepts and principles of aging. Introduces students to the aging process and assists them in understanding the various aspects of growing old. Same as HL S 492 with differentiated assignments for graduate students.	
MPH 593. Adulthood and Aging	3 cr.
Normal transitions in later life; those occurring from 40 years of age to the end of life are discussed. Changes in interpersonal relationships and adaptations commonly made by individuals and meeting those alterations are presented through research findings, case studies, and autobiographies. Same as GERO 493 with differentiated assignments for graduate students.	
MPH 594. Aging in a Multicultural Society	3 cr.
Study and comparison of aging in the southwestern multi-cultural society with emphasis on health care. Same as GERO 494 with differentiated assignments for graduate students.	
MPH 596. Field Experience	1-4 cr.
Student will work in a public health setting under the supervision of an experienced public health professional and will use acquired knowledge	

and skills to conduct a project which addresses a specific public health problem or program need. Projects are agreed upon by the student and faculty. Prerequisite: consent of department head. May be repeated for a maximum of 4 credits. Restricted to MPH majors.

MPH 597. Graduate Public Health Seminar	1 cr.
Capstone seminar for advanced-standing MPH students. Restricted to MPH majors. Prerequisite: MPH 570. May be repeated for a maximum of 2 credits.	
MPH 599. Master's Thesis	1-6 cr.
Minimum of 4 credits required but may be repeated for a maximum of 6 credits. Restricted to MPH majors. PR grading.	

NURSING

School Website: <http://www.nmsu.edu/~nursing/>
(575) 646-4387
khuttlin@nmsu.edu

W. Borges, Ph.D. (UT Houston Health Science Center) –chronic disease, self-management interventions, health disparities; M. Hoke, Ph.D. (New Mexico State)-health disparities, curriculum and instruction, community health nursing; K. Huttlinger, Ph.D. (Arizona)-nursing, anthropology, diabetes, Native American health disparities; B. Keele, Ph.D. (Kansas)-community, clinical practice research, health disparities; T. Keller, Ph.D. (St. Louis) - health care policy, health and nursing administration, professional issues; I. Mullins (Georgia State) - health promotion, health disparities; M. Pase, M.S.N. (Vanderbilt)- advanced medical-surgical nursing; A. Reinhardt (OHSU) - administration, leadership, organization, work environments; G. Schmotzer (UCSF) - health disparities, cancer prevention; P. Schultz, Ph.D. (Texas Woman's)-mental health, cancer, health disparities.

DEGREE: Master of Science in Nursing
SPECIALIZATION: Nursing Administration

DEGREE: Doctor of Nursing Practice
SPECIALIZATION: Adult Health Nursing
SPECIALIZATION: Advanced Practice in Psychiatric-Mental Health Nursing
SPECIALIZATION: Public/Community Health Nursing

DEGREE: Doctor of Philosophy
MAJOR: Nursing

The School of Nursing offers graduate course work for nurses leading to a Master of Science in Nursing (M.S.N.) and Doctor of Philosophy (Ph.D.) degrees. Areas of MSN study include nursing administration, public/community health nursing, advanced clinical practice tracks in adult health nursing and psychiatric/mental health nursing. The MSN curriculum is designed to provide students with the knowledge and experience to assume leadership roles in a variety of health care delivery systems. Students are prepared to secure middle- and top-level administrative positions in health care agencies; function as advanced-practice nurses in psychiatric/mental health and adult health settings; assume leadership positions in a variety of public and community health settings including schools, state and county health departments, maternal/child agencies, public and community health education, and rural community organization; meet the fundamental academic requirements necessary to teach in basic nursing education programs or manage continuing nursing education programs.

The MSN curriculum includes those courses required for graduates in advanced clinical practice specialty tracks to sit for national clinical nurse specialist and nurse practitioner specialty credentialing examinations and to apply for New Mexico clinical nurse specialist and nurse practitioner licensure. The program is accredited by the Commission on Collegiate Nursing Education Accreditation Commission.

The intent of the nursing doctoral program is to prepare individuals who can assume leadership roles in academia, including the scholarship of teaching, research, and professional service activities. The focus of the program is on nursing scholarship to facilitate development of new knowledge and nursing education directed at improving nursing care outcomes for individuals, families, communities, and systems. Holistic nursing scholarship as it relates to improving the care of individuals, families, groups, and communities experiencing or at risk

for health disparities is the emphasis of the program. Holistic nursing scholarship acknowledges the interrelationship of mind, body, and spirit with an emphasis on health promotion and disease prevention. An empowerment/social justice framework guides the distinctive emphasis on border and international context.

Admission to the MSN program is in accordance with the general regulations of the Graduate School. Additional requirements include a B.S.N. from an accredited college or university; successful completion of an inferential statistics course within the last 5 years; three professional letters of recommendation; a letter stating personal goals for graduate education and intended specialty area; resume identifying clinical practice experience; and proof of licensure or eligibility for licensure as a Registered Nurse in any of the 50 United States, the District of Columbia or U.S. territories. Application for admission should be sent to the Graduate School. Letters of reference, personal goals, resume, and proof of licensure should be sent directly to the School of Nursing. On an individual basis, applicants who are registered nurses without a bachelor's degree in nursing, but with a bachelor's degree in another discipline may be considered for admission. To be considered, individuals must complete the full application process and if granted conditional admission by the School of Nursing Graduate Committee successfully complete required bridge courses prior to taking any graduate nursing courses.

Admission to the PhD program is in accordance with the general regulations of the Graduate School. Additional requirements include a MSN from an accredited college or university; successful completion of a graduate level statistics course; three professional letters of recommendation; a letter stating personal goals for graduate education, completions of writing requirement, interview with nursing faculty, resume identifying practice experience; and proof of licensure or eligibility for licensure as a Registered Nurse in any of the 50 United States, the District of Columbia, or U.S. territories. All materials should be sent to the School of Nursing with Graduate School application materials placed in a separate envelope.

The MSN program of study requires all students to take core courses in nursing theory, professional roles, research, and issues influencing health policy and the environment of professional nursing practice. Advanced clinical practice students must also take courses in advanced pathophysiology, advanced assessment, and advanced pharmacology in addition to specialty courses within their area of study. The focus of specific clinical experiences varies with student interest and in consultation with faculty advisers. Students may be part-time or full time. The non-thesis option requires 42 to 54 credit hours including 3 to 9 credits as electives/minor/focus (depending on specialty track) and a comprehensive exam. The thesis option requires a course of study that includes designing and conducting original research under the guidance of a faculty committee. All students must successfully complete a final oral and written examination.

The MSN course of study leading to the master's degree in nursing follows:

ALL STUDENTS

NURS 505, Theoretical Foundations of Advanced Nursing	3
NURS 506, Health Policy and the Environment of Professional Nursing Practice....	3
NURS 507, Research in Nursing	3
NURS 530, Promoting Health Behavior	3

ALL ADVANCED CLINICAL PRACTICE

NURS 508, Professional Roles for Advanced Nursing Practice	3
NURS 511, Advanced Pathophysiology for Clinical Nursing	3
NURS 515, Advanced Nursing Assessment.....	3 (3+2P)

ADVANCED CLINICAL PRACTICE

Adult Health Nursing

NURS 512, Advanced Clinical Pharmacology.....	3
NURS 516, Diagnosis and Management.....	3
NURS 521, Concepts of Adult Health I	3(2+4P)
NURS 522, Concepts of Adult Health II	3(2+4P)
NURS 523, Concepts of Adult Health III-CNS Practicum.....	3(2+4P)
NURS 591, Preceptorship: Prescription of Drugs, Medicines, and Other Therapeutics	8 (4+32P)
Nursing Elective	3

Public/Community Health Nursing

MPH 530, Epidemiological Approaches to Disease Control and Prevention	3
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MPH 550, Environmental Public Health Issues	3
NURS 531 Advanced Community Health Nursing: Concepts and Practice	3 (2+4P)
NURS 532 Advanced Community Health Nursing: Program Planning and Evaluation.....	3 (2+4P)
NURS 533, Advanced Community/Public Health Nursing: Roles	3
NURS 595, Advanced Field Work in Nursing	1-6 (4+24P)
Nursing Electives	9

Psychiatric-Mental Health Nursing

NURS 514, Psychopharmacology for Advanced Practice	3
NURS 540, Advanced Psychosocial Pathology for Psychiatric-Mental Health Nursing	3
NURS 541, Psychiatric-Mental Health Nursing I	3
NURS 542, Psychiatric-Mental Health Nursing II	3
NURS 543, Psychiatric-Mental Health Nursing III	2
NURS 544, Cross Cultural Approaches to Border/Rural Community Mental Health	3
NURS 545, Addictive Disorders	3
NURS 546, Psychiatric-Mental Health Practicum I	1(4P)
NURS 547, Psychiatric-Mental Health Practicum II.....	2 (8P)
NURS 548, Psychiatric-Mental Health Practicum III	1 (4P)
NURS 571, Pharmacology of Addiction for Advanced Practice Nurses	3
NURS 591, Preceptorship: Prescription of Drugs, Medicines, and Other Therapeutics	1-11 (4+44P)

Administration

NURS 562, Nursing in Health Care Organizations	3
NURS 563, Human Resource Management in Nursing	3
NURS 564, Nursing Fiscal Management.....	3
NURS 565, Professional Leadership in Nursing Administration	3
NURS 566, Seminar in Nursing Administration-Roles	2
NURS 567, Nursing Informatics.....	3
NURS 595, Advanced Field Work in Nursing	1-6 (4+24P)
Electives	3

THESIS TRACK

NURS 598, Thesis Seminar	1
NURS 599, Graduate Thesis minimum	4
A ST 505, Statistical Inference I.....	4

NON-THESIS TRACK

Minor or focus area:	6-9
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SPECIALTY-RELATED NURSING ELECTIVES

NURS 513, Diagnostics and Applied Clinical Pharmacology for Advanced Practice Nurses	3
NURS 572, Pharmacology of Addiction.....	3
NURS 550, Curriculum and Teaching In Nursing	3
NURS 551, Measurement and Evaluation in Nursing Education	3
NURS 552, Computer Technologies for Nurse Educators	3
NURS 537, Principles of School Nursing.....	3
NURS 538, Nursing Leadership in School Health Programs.....	3
NURS 539, Pediatric Health Assessment for School Nurses	3

DEGREE: Doctor of Nursing Practice

The Doctor of Nursing Practice (DNP) is a doctoral degree for nurses at the highest level of nursing practice. The American Association of Colleges of Nursing (AACN) has proposed that the DNP degree will be the level of entry for all advanced practice nurses by 2015. Practice-focused doctoral nursing programs prepare leaders for the highest level of practice and is the terminal practice degree. The School of Nursing offers the Bachelor's of Science degree in Nursing (BSN) to DNP and the Master's of Science in Nursing (MSN) to DNP degree. Applications are accepted on an annual basis in early spring for fall cohorts in Psych/Mental Health Nursing, Adult Health and Public Community Health. Psych/Mental Health is offered on odd numbered years and Adult Health and Public/

Community Health on even numbered years. Enrollment is limited and there is no transfer between clinical specialties. Only full-time enrollment is accepted.

DEGREE: Doctor of Philosophy
MAJOR: Nursing

NURS 600, Philosophy of Science in Nursing	3
NURS 601, Theory I: Methods and Processes of Nursing Knowledge	3
NURS 602, Theory II: Contemporary Substantive Nursing Knowledge	3
NURS 606, Quantitative Methods in Nursing Research.....	3
NURS 610, Nursing Education: Pedagogy and Roles	3
NURS 620, Advanced Health Care Statistics I.....	3
NURS 621, Advanced Health Care Statistics II.....	3
NURS 623, Mixed Methods.....	3
NURS 624, Measurement in Culturally Diverse Border Populations.....	3
NURS 630, Issues in Studying Health of Culturally Diverse & Border Populations	3
NURS 631, Population Based Approaches to Health Promotion.....	3
NURS 640, Chronic Diseases: A Health Promotion Approach in underserved Populations.....	3
NURS 650, Behavioral Approaches and Determinants of Nursing and Health ...	3
NURS 690, Ph.D. Nursing Seminar: Developing Research in Nursing	1-3
NURS 700, Doctoral Dissertation	1-9

NURSING

NURS 460. Strategies for Student Success	3 cr.
This course is designed to assist and support students as they identify learning needs and develop a plan for successfully mastering nursing knowledge. Course activities and assignments will be designed to address student's self-identified learning goals to enhance their opportunity for success. Restricted to NURS, BSN, BSNP, BSNR majors.	
NURS 465. Physical Assessment and Evaluation of Child Abuse	3 cr.
This course will acquaint the student with physical assessment of specific injuries found in children who have experienced physical abuse and neglect. Topics will include patient interviewing techniques, taking a medical history, evaluating developmental milestones, and elements of the physical examination. Consent of instructor required.	
NURS 470. Nursing Organization and Management	3 cr.
Concepts of organization and delivery of care to groups of patients based on the nursing process. Emphasis on the roles of the nurse as manager, leader, and change agent within health-care organizations.	
NURS 472. Community and Population Focused Nursing	6 cr. (3+6P)
Synthesis of nursing, social, and public health science to develop health promotion, disease prevention, and protection strategies for communities and populations. Clinical component included.	
NURS 475. Issues and Trends in Professional Nursing	3 cr.
Explores the challenges associated with issues and trends in health care and the legal and ethical implications of professional nursing practice.	
NURS 476. Nursing Organization & Management for the R.N.: Clinical	3 cr. (6P)
Nursing process applied to organization, management, and delivery of health care. An integrating experience for the R.N. student designed to facilitate the transition to professional practice. Students work with mentors in a clinical setting to develop professional nursing roles related to leadership and management.	
NURS 477. Nursing Organization and Management for the RN	3 cr.
Course covers nursing organization, leadership, and management principles, theories, and research for the practicing RN. Restricted to BSNC majors.	
NURS 479. Nursing Care for Complex Patients	8 cr. (2+12P)
Principles and priorities of nursing care for patients across the life span experiencing complex care problems. Includes integrating experiences designed to facilitate the transition from student to professional nurse. Includes clinical component.	
NURS 490. Independent Study	1-3 cr.
Individual studies with prior approval of department head.	
NURS 505. Theoretical Foundations of Advanced Nursing	3 cr.
Nature of theory development in nursing and related disciplines. Analysis of selected theories/models and their application to clinical nursing practice, research, education and administration. Restricted to MSN majors.	
NURS 506. Health Policy and the Environment of Professional Nursing Practice	3 cr.
Conceptual approach to understanding and analyzing the environment of professional nursing practice. Focus on the impact of health care econom-	

ics, financing, law and regulation, ethics and health policy on individual and collaborative nursing practice. Restricted to majors.

NURS 507. Research in Nursing	3 cr.
Process and methods of research and their application to nursing and health care. Emphasis on research utilization.	
NURS 508. Professional Roles for Advanced Nursing Practice	3 cr.
Role preparation for advanced nursing practice. Emphasis on core concepts and responsibilities for development of expertise in health promotion, disease prevention, and other advanced nursing practices. Restricted to majors.	
NURS 511. Advanced Pathophysiology for Clinical Nursing	3 cr.
In-depth study of the physiological and pathological bases of altered health states of patients across the life span. Case studies facilitate application of complex concepts to clinical nursing practice.	
NURS 512. Advanced Clinical Pharmacology	3 cr.
Principles of clinical pharmacology and the related human physiology and pathophysiology for advanced clinical practice.	
NURS 514. Psychopharmacology for Advanced Practice	3 cr.
Principles of clinical psychopharmacology with emphasis on clinical application of major drug classifications including decision making, prescribing, drug monitoring and patient education.	
NURS 515. Advanced Nursing Assessment	3 cr. (2+2P)
Assessment theory and skills for advanced clinical practice. Emphasis on assessment of patients across the life span. Restricted to MSN majors.	
NURS 516. Diagnosis and Management	3 cr.
This course is designed to enhance the student's knowledge of differential diagnosis based on physical assessment through both didactic and clinical methods. Students apply clinical problem-solving skills to determine differential diagnoses and use, interpret and apply laboratory and diagnostic techniques to determine the final diagnosis in adult patients. Prerequisite: NURS 515.	
NURS 521. Concepts of Adult Health I	3 cr. (2+4P)
The course establishes the foundation for a framework of collaborative practice in an advanced nursing practice role and is designed to facilitate the development of a theoretical, practical and evidence-based foundation for management of complex health dysfunctions/alterations in the chronically ill adult. The focus of the didactic and clinical components of the course is on nursing and medical diagnosis and management, pharmacological and non-pharmacological treatments, and an interdisciplinary approach to patients experiencing chronic diseases across the continuum care. Clinical experience include the implementation and evaluation of Medical-Surgical Nursing - Clinical Nurse Specialist roles in primary, secondary, and/or tertiary settings. Illness management, health promotion, and risk reduction are integrated into the assessment and management plans for adult patients. Prerequisite(s): NURS 511, NURS 512, and NURS 515. Restricted to MSN majors.	
NURS 522. Concepts of Adult Health II	3 cr. (2+4P)
The course builds on Adult Health I with a focus on the management of complex health dysfunctions/alterations in the acutely and critically ill adult. Through didactic information and clinical experience, students develop the knowledge base and psychomotor skills central to planning, implementing and evaluating health care for patients with complex health problems commonly seen in acutely and critically ill adults across the continuum of acute care delivery systems. Illness management, health promotion, and risk reduction are integrated into the assessment and management plans for adult patients. Prerequisite(s): NURS 521. Restricted to MSN majors.	
NURS 523. Concepts of Adult Health III - CNS Practicum	3 cr. (2+4P)
This course builds on Adult Health I and II and is designed to transition the graduate nursing students into the Clinical Nurse Specialist role. Emphasis is placed on enhancing competencies within the three spheres of influence of the CNS (patient, nursing, personnel, organization/network) and developing characteristics essential to CNS practice. A major focus is to identify strategies that promote appropriate clinical outcomes of care and cost-efficient utilization resources. Restricted to NURS majors. Prerequisite: NURS 522.	
NURS 530. Promoting Health Behavior	3 cr.
Emphasis is on the role of the advanced practice nurse in facilitating health behavior change. The impact of health status on health behavior, ethical issues relate to health promotion, and the processes for promoting healthy behaviors are explored. Theoretical models of behavior change and primary, secondary, and tertiary prevention concepts serve as a basis for developing nursing interventions that promote behavior change.	
NURS 531. Advanced Community Health Nursing: Concepts and Practice	3 cr. (2+4P)
Covers conceptual basis for advanced community health nursing practice. Emphasis on health care delivery to groups, families, and communities. Prerequisites: MPH 530 and MPH 550.	

- NURS 532. Advanced Community Health Nursing: Program Planning and Evaluation** 3 cr. (2+4P)
Analysis of the impact of cultural, ecological, environmental, and epidemiological influences on the health of the community and populations at risk. Emphasis on strategies for program planning and evaluation. Prerequisite: NURS 531.
- NURS 533. Advanced Community/Public Health Nursing : Roles** 3 cr.
Role preparation for advanced community/public health nursing practice. Emphasis on examining diversity in the role of community and public health nurses and description of the rapidly changing roles, functions and practice settings.
- NURS 537. Principles of School Nursing** 3 cr.
Principles, theoretical frameworks and trends in school nursing; documentation and analysis of models of school nursing practice; identification of issues and future directions; program planning, development, implementation and evaluation; and research applicable to school health. Prerequisite: consent of instructor.
- NURS 538. Nursing Leadership in School Health Programs** 3 cr.
Principles, theoretical framework, and trends of school nursing leadership within the coordinated school health program. Focus on qualifications, roles, and competencies of school nurse administrators; documentation and analysis of school health models; identification of issues and future directions; program planning, development, implementation, and evaluation; and research into school health and leadership roles. Prerequisite: consent of instructor. Restricted to majors.
- NURS 539. Pediatric Health Assessment for School Nurses** 3 cr.
Assessment theory and skills for advanced clinical practice. Emphasis on assessment of the pediatric age group from birth through adolescence in the school setting. Prerequisite: consent of instructor. Restricted to majors.
- NURS 540. Advanced Psychosocial Pathology for Psychiatric-Mental Health Nursing** 3 cr.
In-depth study of psychosocial pathology, factors contributing to psychosocial dysfunction, and diagnostic reasoning basic to advanced-practice psychiatric mental health nursing; emphasis on etiology and differential diagnoses.
- NURS 541. Psychiatric-Mental Health Nursing I** 3 cr.
The first in a three-course series assisting students in learning and practicing principles of adult psychotherapy using psychodynamic and cognitive/behavioral theories within a holistic framework. The concepts of personality development are examined as students learn to work therapeutically with individuals from a diverse cultural and socioeconomic background to develop intervention strategies. Content focuses on management of clients with neurobiological disorders, stressing application of current psychotherapy outcomes research. Must obtain a "B" or better to pass the course.
- NURS 542. Psychiatric-Mental Health Nursing II** 3 cr.
The second in a three-course series in which students continue to develop skills in the practice of psychotherapy in a variety of settings with both individuals and families. This course focuses on family mental health and family functioning. Family dynamics and processes, theories and research are examined as the student continues to develop a conceptual framework to guide clinical practice. Emphasis is placed on increasing understanding of conceptual frameworks and strategies including the role of cultural influences within the family. Must obtain a "B" or better to pass the course. Prerequisites: NURS 541 and NURS 546. Corequisite: NURS 547.
- NURS 543. Psychiatric-Mental Health Nursing III** 2 cr.
The third in a three-course series that assists students in continuing to develop skills to function as a nurse psychotherapist with individuals, families, and groups. Focuses on an advanced study of dysfunctional processes of communication and interpersonal relationships and the therapeutic use of groups for adult clients with a diversity of psychiatric problems and psychosocial stressors. Emphasis is placed on critically analyzing models of group interventions, group dynamics, and processes, including their relevance to a culturally diverse clientele with a variety of lifestyles. Prerequisites: NURS 542 and NURS 547. Corequisite: NURS 548. Restricted to majors.
- NURS 544. Cross-Cultural Approaches to Border/Rural Community Mental Health** 3 cr. (2+7P)
Principles of epidemiology and a cultural lens to explore community mental health assessment, intervention and evaluation of culturally diverse rural/ U.S.-Mexico border communities. Emphasis is on understanding the social/ cultural context of community mental health practice, building collaborative relationships within culturally diverse communities and advancing the a APN's role as a culturally proficient empowerment agent.
- NURS 545. Addictive Disorders** 3 cr.
Focus on care of the individual with addictive disorders. The impact on the individual as well as the community will be examined. Advanced practice nursing interventions based on theoretical and research based knowledge of addictions will be addressed. Treatment of addictive disorders and their relevance to culturally diverse clientele with a variety of lifestyles will be evaluated. Consent of instructor required.
- NURS 546. Psychiatric-Mental Health Practicum I** 1 cr. (4P)
Practice component for the adult psychiatric-mental health clinical specialist/nurse practitioner students.
- NURS 547. Psychiatric-Mental Health Practicum II** 2 cr. (8P)
Practice component for the adult psychiatric-mental health clinical specialist/nurse practitioner students. Prerequisite: NURS 541 and NURS 546. Corequisite: NURS 542.
- NURS 548. Psychiatric-Mental Health Practicum III** 1 cr. (4P)
Practice component for the adult psychiatric-mental health clinical specialist/nurse practitioner students. Prerequisite: NURS 542 and NURS 547. Corequisite: NURS 453.
- NURS 550. Curriculum and Teaching in Nursing** 3 cr.
Seminar and guided experiences in curriculum development and teaching of nursing, including planning, developing, implementing, and evaluating classroom and clinical instruction. Students work with a preceptor and submit a video tape or audio tape of teaching a unit of instruction.
- NURS 551. Measurement and Evaluation in Nursing Education** 3 cr.
Integration of concepts of assessment and evaluation into a nursing education framework. Students analyze assessment, evaluation concepts, models, and frameworks for applicability for students, faculty, curricula, and programs.
- NURS 552. Computer Technologies for Nurse Educators** 3 cr.
Covers a variety of computer technologies including principles for distance learning, use of the Internet in teaching and learning and integrating computer technologies into the teaching-learning process. Emphasis is given to theoretical frameworks that guide the selection, use and integration of computer technologies in nursing education programs.
- NURS 562. Nursing in Health Care Organizations** 3 cr.
Complex dynamics of organizational process, structure, culture, and outcomes emphasizing the integration and analysis of organizational theories and the role of professional nursing in health care organizations.
- NURS 563. Human Resource Management in Nursing** 3 cr.
Contemporary approaches to the development and management of nursing resources that complement organizational vision, strategies and management goals. Management of a diverse, quality workforce that results in an improved organizational performance. Performance evaluation, motivation, professional development and legal and regulatory aspects will be explored.
- NURS 564. Nursing Fiscal Management** 3 cr.
Concepts of financial management for nursing executives emphasizing principles of health care financing, advanced budgeting principles and fiscal responsibility in managing financial resources. A focus on strategic planning for achieving quality outcomes through financial resource management will be integrated into the course. Prerequisite: NURS 562
- NURS 565. Professional Leadership in Nursing Administration** 3 cr.
Analysis of leadership theories as they pertain to the nurse executive in complex health care organizations. Emphasis will be placed on organizational change and conflict management in working with interdisciplinary health care teams. Prerequisite: NURS 562
- NURS 566. Seminar in Nursing Administration- Roles** 3 cr.
Role preparation for the nurse administrator as manager, leader, collaborator and change agent. Synthesis of concepts from management and nursing as a basis for role effectiveness in nursing administration. Corequisite: NURS 595.
- NURS 567. Nursing Informatics** 3 cr.
This course will cover the principles of health data management and health information systems for nurse executives. Emphasis is placed on the integration of health information systems that promote the advancement of nursing practice within health care organizations. Prerequisites: Consent of Instructor
- NURS 571. Pharmacology of Addiction for Advanced Practice Nurses** 3 cr.
Concepts and principles of the pharmacology of psychoactive substances and the addiction process; including decision making, prescribing, drug monitoring and patient education.
- NURS 572. Pharmacology of Addictions** 3 cr.
Concepts and principles of the pharmacology of psychoactive substances and the addiction process; including the pharmacological approach to treatment. Corequisite(s): NURS 572L.
- NURS 572 L. Pharmacology of Addiction Laboratory** 1 cr. (1+2P)
Analysis and applications of concepts and principles of the pharmacology of psychoactive substances and the addiction process, including

pharmacological approach to treatment in selected simulated situations.
Prerequisite(s): NURS 572.

- NURS 573. Cardiovascular/Renal Nursing** 3 cr.
This course emphasizes the comprehensive management of individuals with acute and chronic cardiovascular/renal diseases within the context of family and communities using a case-based approach. Prerequisite(s): Graduate status or permission of instructor.
- NURS 574. Oncology Nursing** 3 cr.
This course presents the clinical aspects of cancer diagnosis, the clinical management of major cancers, and their treatment modalities. The course will also focus on supportive therapies for the cancer patient and symptom management. Prerequisite(s): Graduate status or permission of instructor.
- NURS 575. Professional Roles for Masters Entry to Practice** 3 cr.
Role preparation for Masters entry into nursing. Emphasis on differentiating between the multiple roles of the nurse prepared at the graduate level. Exploration of the diversity of nursing roles in health care. Restricted to MSN majors.
- NURS 590. Independent Study** 1-10 cr.
Individual studies and directed research with prior approval of department head. May be repeated on a different topic. Prerequisite: consent of instructor. May be repeated for a maximum of 20 credits.
- NURS 591. Preceptorship: Prescription Drugs, Medicines and Other Therapeutics** 1-11 cr. (4-44P)
Faculty-coordinated preparation for prescribing drugs, medicines, and other therapeutics within the specialty area under the supervision of a qualified preceptor. Minimum of 8 credits (400 total hours) is required to meet the New Mexico requirement for prescriptive privileges. May be repeated for a maximum of 16 credits. For PMH NP/CNS track, must be enrolled in NURS 543. Prerequisite: NURS 542 or NURS 530 or NURS 521. Graded S/U.
- NURS 595. Advanced Field Work in Nursing** 1-6 cr. (4-24P)
Faculty-supervised, independent work in student's advanced practice role. Field work normally taken after the core and designated specialty courses. Minimum of three field-work credits (12 contact hours) required in major area of study. May be repeated for a maximum of 12 credits. Prerequisites: NURS 532 and NURS 561. Restricted to majors. Graded S/U.
- NURS 596. Writing for Publication from a Health and Nursing Perspective** 3-6 cr.
Application of theories and concepts from previous health and nursing program experiences and related research in the development of a potentially publishable manuscript. Prerequisite: consent of instructor. May be repeated for a maximum of 6 credits. Graded S/U.
- NURS 597. Special Topics** 1-3 cr.
Specific subjects to be announced in the Schedule of Classes. Prerequisite: consent of instructor. May be repeated for a different subject area. May be repeated for a maximum of 8 credits.
- NURS 600. Philosophy of Science in Nursing** 3 cr.
Offers a framework for asking both ontological and epistemological questions about knowledge, human science, and nursing science.
- NURS 601. Theory I: Methods and Processes of Nursing Knowledge Development** 3 cr.
Building on the Philosophy of Science course, the student will engage in analysis and critique of both developmental processes and composition of nursing disciplinary knowledge. Diverse approaches will be used to appraise and critique historical and contemporary milestones in the development and evaluation of nursing thought. Emphasis is also placed on implications of theory and knowledge development as related to multicultural and rural issues. Prerequisite(s): NURS 600.
- NURS 602. Theory II: Contemporary Substantive Nursing Knowledge** 3 cr.
Critically examine existing & evolving substantive knowledge drawn from nursing and other disciplines. Focus on the construction, analysis of current substantive nursing knowledge, including evaluation of relationships among theories, evidence and explanation will be pursued. Special attention to existing and evolving theories applicable to rural, multicultural and educational settings. Prerequisite: NURS 601
- NURS 606. Quantitative Methods in Nursing Research** 3 cr.
Focus on approaches to developing nursing knowledge by means of quantitative research methods as applied to clinical problems, theoretical modeling of human responses to health and illness, and health policy issues. Emphasizes detailed analysis and critique of non-experimental and experimental designs, issues pertaining to sampling and statistical power, the reliability and validity of measures, and uses and abuses of descriptive and inferential statistics in nursing research literature. Students are expected to develop sufficient discernment to read, critique, evaluate, and discuss the quality, significance, and limitations of published quantitative nursing research. Prerequisite: NURS 621.
- NURS 607. Qualitative Methods in Nursing Research** 3 cr.
Major methodological traditions of qualitative research and their applications to knowledge development and clinical research in nursing are the emphasis. Overview of at least one computer-assisted qualitative data analysis software application. Students will engage in detailed critique and discussion of significant nursing investigation representing various qualitative approaches and traditions.
- NURS 608. Field Methods in Qualitative Research** 3 cr.
The purpose of this course is to provide opportunities for students to engage in, analyze and evaluate various procedures and techniques used to gather qualitative data. Major data collection approaches including ethnography, phenomenology, grounded and critical theory are discussed. Students have the opportunity to participate in mini-field work projects while gathering expertise in field techniques used in qualitative research. Issues such as role of literature in qualitative research, investigator as instrument, ethical dilemmas, field entry and departure, and reflexivity are analyzed as they relate to the process of gathering and interpreting qualitative data. Prerequisites: NURS 607 or consent of instructor.
- NURS 610. Nursing Education: Pedagogy and Roles** 3 cr.
Teaching-learning process in the clinical and classroom settings. Focuses on educational patterns and pathways in nursing and the roles of faculty in academia. Educational reform is analyzed in relationship to diversity in students, faculty, practice settings and technology-driven learning environments. Instructional designs, teaching strategies, and outcome evaluations are examined for their pedagogic use. The development of critical thinking outcomes, mentorships and partnerships to meet the needs of students are addressed. The course examines issues and challenges that impact the educational process such as student and faculty recruitment, the changing healthcare environment, differentiation of practice, advanced practice, reduced resources and links with theory and research.
- NURS 620. Advanced Health Care Statistics I** 3 cr.
This course provides knowledge, skills and practice in collecting, analyzing and interpreting data. The following quantitative techniques will be examined and utilized using SPSS: principle of measurement, probability, principles of parametric and non parametric techniques, Kolmogorov-Smirnov test, comparison of means, correlation analyses, use of psychometric techniques, binomial test, sign test, McNemar test, median test, Cochran Q test, Phi coefficient, Fisher's Exact test, Mann-Whitney U, Kruskal-Wallis test, Wilcoxon Signed Ranks and Spearman Rho. A graduate level statistics course completed within three years prior to the date of expected admission is desirable. Restricted to majors.
- NURS 621. Advanced Health Care Statistics II** 3 cr.
This course is the second of a two-semester quantitative statistical course designed to provide knowledge, skills and practice in collecting, analyzing, and interpreting data. The following quantitative techniques will be examined and utilized using SPSS: analysis of variance (ANOVA), analysis of covariance (ANCOVA), linear, multiple, and logistic regression, structural equation modeling (SEM), principle components analysis, and factor analysis. Restricted to majors. Prerequisite: NURS 620.
- NURS 623. Mixed Methods** 3 cr.
Presents a brief overview of research paradigms with emphasis on formulating research questions, aims and methods for a mixed method/model approach. Students may use proposals developed in earlier qualitative and quantitative research classes to devise mixed method proposal integrating readings on these methods and own research interests. Prerequisite: NURS 606 and NURS 607
- NURS 624. Measurement in Culturally Diverse Border Populations** 3 cr.
The focus of this course is the development of essential competencies required to locate, select, evaluate, and use instruments to operationalize nursing variables. Ethical considerations in nursing research and research issues in diverse populations will be discussed. Specific attention is given to the process of moving from concept to construct, measurement theory, validity/reliability issues, and measurement issues in diverse populations including literacy, social desirability bias, sensitive data, translations, and cultural equivalency. Prerequisite(s): Admission to PhD in Nursing program; NURS 606; NURS 623; or consent of Instructor. Restricted to PhD in Nursing majors.
- NURS 630. Issues in Studying Health of Culturally Diverse and Border Populations** 3 cr.
Health of culturally diverse and border populations will analyze the unique characteristics and future trends of health care and professional nursing using the Southwestern U.S., and the U.S.-Mexico border area as the case exemplar. Course content includes identifying and examining health care issues from multi-contextual local, regional, national, and international perspectives. Strategies to examine and affect health will incorporate rigorous critical reflection and dialogue, analysis and synthesis of ideas drawing on multi-disciplinary literature, and experiences with working with community

- based organizations and local advocacy groups to develop action plans for research and health care services.
- NURS 631. Population Based Approaches to Health Promotion** 3 cr.
Population based approaches to health promotion focuses on preparing nursing students to identify, critically analyze and evaluate health promotion initiatives in culturally diverse and border populations using the Southwestern U.S. and U.S./Mexico border as the case exemplar. It examines historical, socio-economic, legal and professional issues associated with health promotion and policy initiatives. It considers prospects for social change, political movements and alternative approaches to develop and hasten adaption of health promotion initiatives in partnership with communities, advocacy groups and health care agencies.
- NURS 640. Chronic Diseases: A Health Promotion Approach in Underserved Populations** 3 cr.
Focus on the interrelationships of various chronic diseases and conditions in the understanding of how co-morbidities influence the prevention and health promotion in the infant, school-age child, adolescent, young, middle, and older adult. Students will apply and synthesize an understanding of chronic conditions such as cancer, cardiovascular disease, diabetes mellitus, COPD, asthma, osteoporosis, and sickle cell disease, among others, and how the various aspects of these conditions are interrelated, particularly in underserved populations resulting in health care disparities.
- NURS 650. Behavioral Approaches and Determinants of Nursing and Health** 3 cr.
Focuses on how behavioral/mental health concepts are applied in determining health outcomes for individuals, families, and communities. Students will apply and synthesize theoretical constructs within practice and research focusing on behavioral/mental health concepts. Health outcomes are viewed in a traditionally holistic manner in that health outcomes are discussed as an integral part of the human experience of healing and health.
- NURS 690. PhD Nursing Seminar: Developing Research in Nursing** 1-3 cr.
Seminar to build nursing research skills broken into 3, 1 credit seminars that are taken throughout the PhD Program.
- NURS 691. Independent Study** 1-6 cr.
Individual studies and directed research with prior approval of department head. Prerequisite: consent of instructor. May be repeated for a maximum of 12 credits.
- NURS 700. Doctoral Dissertation** 1-9 cr.
Dissertation may be repeated to maximum of 30 credits. Minimum requirements are 21 credit hours. Comprehensive examine is included within these 21 credits.
- NURS 999. Practical Nursing Requirements Completed** 0-99 cr.
A phantom course created to indicate a student has met Practical Nursing requirements. Used to indicate this in academic history to replace an administrative message not converted from SOLAR to VISTAS. 01/97

SOCIAL WORK

Department website: <http://www.nmsu.edu/~socwork/>
(575) 646-2143
socwork@nmsu.edu
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Shelly A. Bucher, LMSW, Interim Director

S. C. Anderson, Ph.D. (Texas-Austin)-mental health, child welfare, practice, policy; T. Barnett-Queen, Ph.D. (South Carolina)-technology and social work education, mental health, supervision; D. Barney, Ph.D. (Kansas)- adolescent health, human sexuality, HIV/AIDS; R. Blair, Ph.D. (Utah)-mental health, individual therapy; A. Chornesky, Ph.D. (Smith College)-child/adult development, crosscultural practice; K. Coggins, Ph.D. (Michigan)- community interventions, cultural competence, indigenous North American populations; I. de la Rosa, Ph.D. (Michigan)-crosscultural practice, research; M. Ortiz, M.S.W. (NMSU)-cultural competence, practice; M. Roditti, Ph.D. (Case Western Reserve University)-community practice, social support networks; P. Sandau-Beckler, Ph.D. (Case Western Reserve)-AIDS, practice; W. Whittlesey-Jerome, Ph.D. (Texas-Arlington)-mental health, policy, research

DEGREE: Master of Social Work

MINOR: Alcohol and Drug Counseling (interdisciplinary)

The School of Social Work offers full-time and part-time graduate study in Las Cruces and Albuquerque leading to the Master of Social Work (M.S.W.)

degree. The program is designed to provide academic and fieldwork education with an emphasis in Advanced Generalist Practice with Populations of the Southwest based on the foundation first year of generalist practice. The program is fully accredited by the Council on Social Work Education (CSWE).

Admission to the program is in accordance with the general regulations of the Graduate School, which include a completed undergraduate degree from an accredited institution. In addition to applying to the Graduate School, application must also be made to the School of Social Work. The application to the School of Social Work spells out admission requirements that include submitting an application form, a written statement, a current resume and personal references and statistics course. Applicants having a degree from a non-liberal arts area must show coursework that includes two courses from the humanities, two from the natural and biological sciences (with one course containing content in human biology) and three from the behavioral and social sciences, with at least one course in sociology or psychology. The program does not grant academic credit for work or other life experience in lieu of social work course or field content.

The School of Social Work is committed to ensuring a culturally diverse student population to enhance the social work profession at both state and national levels. To meet this goal of diversity, the school makes an effort to recruit and retain a diverse student population.

Applicants who qualify for advanced standing may complete the program with 36 credits rather than 60 credits. Admission to the advanced-standing program is for highly qualified applicants who have a Bachelor of Social Work degree (B.S.W.) from a social work program accredited by the CSWE and earned within seven years of beginning the advanced standing program, a GPA of at least 3.5 in the last 60 hours and a two-year post BSW degree work experience. As part of the M.S.W. application, those applying to the advanced standing program will, in addition to meeting all admission requirements for the full-time, two-year program or part-time, three-year program, submit two additional letters of reference, one each from a B.S.W. field liaison and B.S.W. field supervisor or instructor, and a copy of the final B.S.W. field evaluation.

The requirements for the Master of Social Work degree include 60 credits of designated graduate courses (36 credits of designated graduate courses for those accepted for advanced standing); a grade-point average of at least 3.0 on a 4.0 scale in all course and fieldwork, and for those electing the thesis option, the completion of a thesis. The thesis requires a slightly different course of study, including an approved proposal. Those students who plan to pursue a doctoral degree are encouraged to elect the thesis option.

Note that all social work courses must be taken in sequence. Successful completion of course work for each semester is a prerequisite for the course work of the following semester.

Any social work graduate student who receives an F in a social work course is dismissed from the program and must reapply for admission to the MSW program. Any social work student who receives a D in a social work course must repeat the course. Any social work student who receives 2 D's in social work courses is dismissed from the program and must reapply for admission to the MSW program.

An integral part of a graduate social work program is completing the practicum experience. For those enrolled in the two-year program, two practicum placements will be required (12 credits), which result in the student's spending 950 hours in the field. For those students entering the program with advanced standing, one field placement (6 credits) is required, totaling 500 hours in the field. Students are offered a wide range of field settings in New Mexico and West Texas. Students should be prepared to travel some distance and be responsible for their own transportation costs.

APPLICATION DEADLINES

The deadline for complete applications is February 15th of each year.

- Early applications received by January 1st will be given first consideration for Graduate Assistantships.
- Late applications that are complete will be considered when received on a space available basis.

Course of Study:

Full-Time Program (60 cr.).
Advance-Standing (36 cr.).

YEAR ONE

Fall Semester (15 cr.)

MSW 505, Foundations of Professional Social Work 3 cr

MSW 509, Sociocultural Concepts and Populations of the Southwest	3 cr.
MSW 510, Human Behavior and Social Environment I	3 cr.
MSW 520, Practice II: Social Work Practice I	3 cr.
MSW 551, Generalist Field Practicum I	3 cr.

Spring Semester (15 cr.)

MSW 500, Social Problems and Social Welfare Policy	3 cr.
MSW 511, Human Behavior and Social Environment II	3 cr.
MSW 521, Social Work Practice II	3 cr.
MSW 552, Generalist Field Practicum II	3 cr.
MSW 560, Social Work Research	3 cr.

YEAR TWO**Fall Semester (15 cr.)**

MSW 524 Practice III: Advanced Practice with Individuals	3 cr.
MSW 526, Practice V: Advanced Practice with Families	3 cr.
MSW 554, Advanced Generalist Field Experience I	3 cr.
MSW 561, Advanced Generalist Research,	3 cr.
or MSW 599, Graduate Thesis	3 cr.
MSW or/outside elective or MSW 547 Social Work Mental Health Practice.....	3 cr.

Spring Semester (15 cr.)

MSW 503, Policy Analysis and Change.....	3 cr.
MSW 525, Practice IV: Advanced Genetics Practice with Groups	3 cr.
MSW 527, Practice VI: Advanced Practice with Organizations and Communities	3 cr.
MSW 555, Advanced Generalist Field Experience II	3 cr.
MSW or outside elective.....	3 cr.

COURSE OF STUDY: ADVANCED STANDING (36 cr.)

Full-Time Advanced Standing begins in Summer and then follows Year Two schedule.

Summer

MSW 509, Sociocultural Concepts and Populations of the Southwest	3 cr.
MSW 559, Practice and Research	3 cr.

MSW Electives (choose at least one to complete the two elective requirement)

MSW 501, Social Work Leadership and Administration
 MSW 541, Alcohol and Other Drugs (AOD Minor)
 MSW 542, Violence in the Family
 MSW 543, Family and Child Welfare Practice
 MSW 547, Social Work Mental Health Practice
 MSW 563, Social Work with Hispanic Populations
 MSW 564, Social Work with Native American Populations
 MSW 565, Practice with the Elderly
 MSW 590, Family and Child Welfare Policy
 MSW 597, Special Topics

Other disciplines for one requirement:

MSW elective courses not listed above, Sociology, Anthropology, Psychology, Health Science, Family and Consumer Science, Counseling and Education Psychology, Economics, Management, Government, Statistics, Women's Studies, Criminal Justice.

COURSE OF STUDY: PART-TIME PROGRAM (60 cr.)**YEAR ONE****Fall Semester**

MSW 505, Foundations of Professional Social Work.....	3 cr.
MSW 510, Human Behavior in the Social Environment I	3 cr.

Spring Semester

MSW 511, Human Behavior in the Social Environment II	3 cr.
MSW 560, Social Work Research	3 cr.

Summer

MSW 500, Social Problems and Social Welfare Policy	3 cr.
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MSW 509, Sociocultural Concepts and Populations of the Southwest.....	3 cr.
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YEAR TWO**Fall Semester**

MSW 520, Social Work Practice I	3 cr.
MSW 551, Generalist Field Practicum I	3 cr.
MSW 561, Advanced Generalist Research	3 cr.
or MSW 599, Graduate Thesis.....	3 cr.

Spring Semester

MSW 521, Social Work Practice II	3 cr.
MSW 552, Generalist Field Practicum II	3 cr.
MSW 503, Policy Analysis and Change.....	3 cr.

Summer

MSW or outside elective.....	3 cr.
MSW or outside elective.....	3 cr.

YEAR THREE**Fall Semester**

MSW 524, Practice III: Advanced Practice with Individuals.....	3 cr.
MSW 526, Practice V: Advanced Practice with Families	3 cr.
MSW 554, Advanced Generalist Field Experience I.....	3 cr.

Spring Semester

MSW 525, Practice IV: Advanced Generalist Practice with Groups.....	3 cr.
MSW 527, Practice VI: Advanced Practice with Organizations and Communities.....	3 cr.
MSW 555, Advanced Generalist Field Experience II	3 cr.

PART-TIME ADVANCED STANDING (36 CR.)**YEAR ONE****Summer**

MSW 559, Practice and Research	3 cr.
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Fall Semester

MSW 525, Practice IV: Advanced Generalist Practice with Groups.....	3 cr.
MSW or outside elective.....	3 cr.

Spring Semester

MSW 503, Policy Analysis and Change.....	3 cr.
MSW or outside elective.....	3 cr.

Summer

MSW 509, Sociocultural Concepts and Populations of the Southwest.....	3 cr.
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YEAR TWO**Fall Semester**

MSW 524, Practice III: Advanced Practice with Individuals.....	3 cr.
MSW 561, Advanced Generalist Research.....	3 cr.
or MSW 599, Graduate Thesis.....	3 cr.
MSW 554, Advanced Generalist Field Experience I	3 cr.

Spring Semester

MSW 526, Practice V: Advanced Practice with Families	3 cr.
MSW 527, Practice VI: Advanced Practice with Organizations and Communities.....	3 cr.
MSW 555, Advanced Generalist Field Experience II	3 cr.

MSW Electives

MSW 501, Social Work Leadership and Administration
 MSW 541, Alcohol and Other Drugs (AOD Minor)
 MSW 542, Violence in the Family
 MSW 543, Family and Child Welfare Practice
 MSW 563, Social Work Practice with Hispanic Populations
 MSW 564, Social Work Practice with Native American Populations
 MSW 565, Practice with the Elderly
 MSW 590, Family and Child Welfare Policy

MSW 597, Special Topics

Related Outside Elective Examples (choose one graduate level):

MSW elective courses not listed above, Sociology, Anthropology, Psychology, Health Science, Family and Consumer Science, Counseling and Education Psychology, Economics, Management, Government, Statistics, Women's Studies, Criminal Justice.

JOINT DEGREE PROGRAM AND INTERDISCIPLINARY GRADUATE MINORS

Joint MSW/MPH Degree Program

The School of Social Work and the Department of Health Science offer a joint MSW/MPH degree program. The two degrees are: Master of Social Work (MSW) and Master of Public Health (MPH) in Community Health Education. Students interested in pursuing the joint degree program must:

- Prepare and submit separate admissions applications to both programs
- Notify each program in writing of the intent to complete the joint degree program
- Be officially admitted to both degree programs
- Notify the NMSU Graduate School of the intent to complete the joint degree program
- Complete all course requirements for both degree programs
- Complete separate final examinations for both degree programs

If you are interested in pursuing this option please call and talk to the Graduate Program Coordinator. It is anticipated that students in this program will take three academic years to complete the joint MSW/MPH degree programs.

INTERDISCIPLINARY GRADUATE MINORS

Minor in Alcohol and Drug Counseling

This minor involves the departments of: Counseling and Educational Psychology; Criminal Justice; Family and Consumer Science; Health Science; Nursing; and Social Work. Completion of this minor will prepare students for completion of the coursework necessary to take the exam for state licensure as a drug and alcohol counselor in the State of New Mexico. If you are interested in the minor please request an information sheet from the Graduate Program Coordinator that will outline the program requirements and specify the application process.

Minor in Gerontology

The Department of Health Science offers an online Graduate Minor in Gerontology. The Minor in Gerontology program is designed in part for non-traditional, location-bound students, who are working or otherwise occupied on a full-time basis. Health and human service professionals, current students, and others who are interested in acquiring basic knowledge in an interdisciplinary gerontology context are encouraged to consider this program. If you are interested in the minor please request an information sheet from the Graduate Program Coordinator that will outline the program requirements and provide contact information.

SOCIAL WORK

- S WK 463. Social Work Practice with Hispanic Families 3 cr.
Theory and skills relating to social work practice with Hispanic families. Emphasis on strengthening and empowering Hispanic families to perform their caregiving roles in their own environment. Prerequisite: S WK 300, S WK 313, S WK 314 and S WK 400.
- S WK 465. Practice with the Elderly 3 cr.
Concepts and skills needed for effective practice with older adults, their families, and others in their support systems. Attention to subgroups on an older population, including persons of color, health-impaired individuals, grandparent caregivers, and elderly gay men and women. Taught with MSW 565. Cannot receive credit for S WK 465 and MSW 565. Prerequisite(s): S WK 300, S WK 313, S WK 314 and S WK 400.
- S WK 467. Social Work Research I 3 cr.
Development of knowledge and skills needed to build practice knowledge, evaluate service delivery, and be effective consumers of research knowledge. The first of a two-course sequence that covers research methods, history of research, ethics, problem formulation, research design, measurement, and instrumentation. Restricted to SW K majors.
- S WK 468. Social Work Research II 3 cr.
Development of knowledge and skills needed to build practice knowledge, evaluate service delivery, and be effective consumers of research knowl-

edge. The second of a two-course sequence that covers research literature, data collection, and data analysis. Prerequisite: S WK 467. Restricted to S WK majors.

- S WK 490. Family and Child Welfare Policy 3 cr.
Historical review and evolution of child welfare policies, initiatives and factors that influence child welfare service. Child welfare policies and services specific to the state of New Mexico are infused throughout the course. Taught with MSW 590. Cannot receive credit for S WK 490 and MSW 590. Prerequisite(s): S WK 313, S WK 314 and S WK 400.
- S WK 497. Special Topics 1-3 cr.
Specific subjects to be announced in the Schedule of Classes. May be used as a mandatory practice elective. Prerequisite: junior or above standing, majors or consent of instructor. May be repeated for unlimited credit under different subtitles.

MASTERS OF SOCIAL WORK

- MSW 500. Social Problems and Social Welfare Policy 3 cr.
An overview of social and economic problems in the United States and the historical and current social welfare policies aimed at alleviating these problems. Emphasis on developing an awareness and ability to change policies that impact vulnerable populations.
- MSW 501. Social Work Leadership and Administration 3 cr.
Supervision, consultation, and administration in social services, emphasis on developing leadership skills. Prerequisite(s): MSW 520, MSW 521. Restricted to MSW majors.
- MSW 503. Policy Analysis and Change 3 cr.
This course will emphasize policy practice focusing on policy analysis and creating and implementing policy change. Prerequisite(s): MSW 500. Restricted to MSW majors.
- MSW 505. Foundations of Professional Social Work 3 cr.
This course is a comprehensive overview of social work. It serves as an introduction to the profession of social work, including its history, values and ethics, legal regulation, structure, philosophy and major fields of practice.
- MSW 509. Sociocultural Concepts and Populations of the Southwest 3 cr.
Theoretical and sociohistorical perspectives on racism, sexism, ageism, heterosexism, classism, ableism, and other forms of discrimination and oppression. Cultural diversity, strengths, and Southwest and border issues are emphasized.
- MSW 510. Human Behavior and the Social Environment I 3 cr.
The major theories of human behavior and the life span from conception to adolescence. Focuses both on the areas of concern and risk for client systems and on the opportunities and strengths in the social environment. Required. Restricted to MSW majors.
- MSW 511. Human Behavior and the Social Environment II 3 cr.
Major theories of human behavior and the life span from young adulthood through old age. Focuses on the areas of concern and risk for client systems and on the opportunities and strengths in the social environment. Required. Prerequisite(s): MSW 510.
- MSW 520. Social Work Practice I 3 cr.
This is the first course of a two-course sequence. An introduction to the generalist crosscultural, social work practice perspective with individuals and families, focusing on social work as a profession, social work knowledge base, professional development, relationship building and assessment with individuals and families within a framework of social work values and ethics. Corequisite(s): MSW 551. Pre/Corequisite(s): MSW 505 and MSW 510. Restricted to MSW majors.
- MSW 521. Social Work Practice II 3 cr.
This is the second course of a two-course sequence. A continuation of the generalist crosscultural, social work practice perspective with individuals and families, focusing on goal setting, contracting, implementation, and outcome assessment. The course also applies the generalist practice perspective and methods to larger systems: groups, organizations, and communities and includes relationship building, assessment, goal setting, contracting, implementation and outcome assessment within a framework of social work values and ethics. Prerequisite(s): MSW 520. Corequisite(s): MSW 552. Restricted to MSW majors.
- MSW 524. Practice III: Advanced Practice with Individuals 3 cr.
This class builds on Foundation Year Practice courses (MSW 520, 521) by integrating theory and practice, and advancing skills in selecting, applying and evaluating practice interventions in a culturally sensitive manner with individuals (children, adolescents and adults). Prerequisite(s): MSW 520, MSW 521. Corequisite(s): MSW 526, MSW 554. Restricted to MSW majors.
- MSW 525. Practice IV: Advanced Generalist Practice with Groups 3 cr.
This course will address the knowledge, values and skills needed to work

- effectively with diverse populations in group settings. The course will build on Foundation Year courses (MSW 520 and 521) by integrating theory and practice, and advancing skills in selecting, applying and evaluating practice interventions in a culturally sensitive manner with social work groups. Prerequisite(s): MSW 520, MSW 521, MSW 551, MSW 552. Restricted to MSW majors.
- MSW 526. Practice V: Advanced Practice with Families** 3 cr.
This class builds on Foundation Year Practice courses (MSW 520 and 521) by integrating theory and practice, and advancing skills in selecting, applying, and evaluating practice interventions in a culturally sensitive manner with families. Prerequisite(s): MSW 520, MSW 521, MSW 552. Corequisite(s): MSW 554. Restricted to MSW majors.
- MSW 527. Practice VI: Advanced Practice with Organizations and Communities** 3 cr.
This class builds on Foundation Year Practice courses (MSW 520, 521) by integrating theory and practice, and advancing skills in selecting, applying, and evaluating practice interventions in a culturally sensitive manner with organizations and communities. Prerequisite(s): MSW 520, MSW 521, MSW 524, MSW 525, MSW 554. Restricted to MSW majors.
- MSW 541. Alcohol and Other Drugs** 3 cr.
The prevalence of the major types of substance abuse. Addresses major treatment approaches to substance abuse as well as theories related to the causes and effects of such abuse in systems of different sizes. Prerequisite(s): Consent of instructor.
- MSW 542. Violence in the Family** 3 cr.
Theory and skills relating to practice with families who victimize vulnerable members. Includes physical, emotional and sexual abuse, incest, and neglect. Emphasis on knowledge and skills in approaches that effectively preserve and restore healthy family functioning. Prerequisite: consent of instructor.
- MSW 543. Family and Child Welfare Practice** 3 cr.
Current issues and interventions in child protection, foster care, family preservation and support, family reunification, adoption, and permanency planning. Cannot receive credit for SVK 443 and MSW 543.
- MSW 547. Social Work Mental Health Practice** 3 cr.
Social work assessment and interventions of major mental health issues across the life span with an emphasis on building resiliency and coping skills. Attention will be paid to mental health disparities and the impact of culture on mental health issues. Offered in the fall. Prerequisite(s): MSW 521.
- MSW 551. Generalist Field Practicum I** 3 cr.
Supervised professional practice in a community social service agency, providing experiential instruction and learning. 225 clock hours required. Seminar required. Graded: S/U. Pre/Corequisite(s): MSW 505, MSW 509, MSW 510, MSW 520. Restricted to MSW majors.
- MSW 552. Generalist Field Practicum II** 3 cr.
Supervised professional practice in a community social service agency. 225 clock hours required. Seminar required. Prerequisite(s): MSW 520, MSW 551. Pre/Corequisite(s): MSW 500, MSW 510, MSW 511, MSW 521, MSW 560. Restricted to MSW majors.
- MSW 554. Advanced Generalist Field Experience I** 3 cr.
Supervised professional practice in a community social service agency providing experiential learning in advanced generalist practice. 250 clock hours required. Seminar required. Prerequisite(s): MSW 552. Corequisite(s): MSW 524, MSW 526. Restricted to MSW majors.
- MSW 555. Advanced Generalist Field Experience II** 3 cr.
Supervised professional practice in a community social service agency providing experiential learning in advanced generalist practice. 250 clock hours required. Seminar required. Prerequisite(s): MSW 554. Corequisite(s): MSW 525, MSW 527. Restricted to MSW majors.
- MSW 559. Practice and Research** 3 cr.
This course is required for all advanced standing students and is aimed at providing the conceptual orientation for the concentration year graduate program. The goal of this course is to enhance theory, practice, research, and policy skills and knowledge in advanced generalist social work. The key themes and concepts, presented, explored, and analyzed in this course include: the fit between the Social Work code of ethics and personal values and belief systems; use of evidenced based practice principles to critique theories, policy, and practice and the interaction with research modalities applicable to social work practice with individuals, groups, organizations and communities. Restricted to MSW Advanced Standing majors.
- MSW 560. Social Work Research** 3 cr.
Introduction to analytical skills used in social work research: problem formulation, research designs, measurement, instrumentation, data collection and analysis, use of human subjects in research, and application of research knowledge to social work practice. Required. Restricted to MSW students.
- MSW 561. Advanced Generalist Research** 3 cr.
Focused on advanced generalist practice research in multicultural settings. Advanced skills to evaluate practice with individuals, families, groups, organizations and communities in multicultural settings. Needs assessment as well as program and practice evaluation are emphasized. Prerequisite(s): MSW 560. Restricted to MSW majors.
- MSW 563. Social Work with Hispanic Populations** 3 cr.
This course focuses on advanced knowledge and skill development for intervention with Hispanic populations. Emphasis is placed on understanding historical and contemporary cultural, social and political forces shaping the worldview and life circumstances for Hispanic populations in the US Southwest.
- MSW 564. Social Work with Native American Populations** 3 cr.
This course focuses on advanced knowledge and skill development for intervention with Indigenous North American populations. Emphasis is placed on understanding historical and contemporary cultural, social and political forces shaping the worldview and life circumstances for Indigenous North American populations.
- MSW 565. Practice with the Elderly** 3 cr.
Concepts and skills needed for effective practice with older adults, their families, and others in their support systems. Attention to subgroups of an older population, including persons of color, health-impaired individuals, grandparent caregivers, and elderly gay men and women. Taught with S WK 465 with additional work required at the graduate level. Cannot receive credit for both SVK 465 and MSW 565.
- MSW 572. Pharmacology of Addictions** 3 cr.
Concepts and principles of the pharmacology of psychoactive substances and the addiction process: including the pharmacological approaches to treatment. Corequisite: MSW 572L. Same as NURS 572.
- MSW 590. Family and Child Welfare Policy** 3 cr.
Historical review and evolution of child welfare policies, initiatives and factors that influence child welfare service. Child welfare policies and services specific to the state of New Mexico are infused throughout the course. Taught with S WK 490 with additional work required at the graduate level. Cannot receive credit for both SVK 490 and MSW 590. Prerequisite(s): SVK 300, SVK 313, SVK 314 and SVK 400.
- MSW 591. Systemic Integration of Alcohol and Drug Issues** 3 cr.
Capstone course for the alcohol and drug minor. Covers community, agency, and systemic facilitation of prevention and intervention services for substance-affected families. Prerequisites: acceptance into minor and department prerequisites. Same as FCS 591.
- MSW 595. Independent Study** 1-3 cr.
Individual study to augment depth of knowledge in area related to course of study. Prerequisite: consent of instructor. May be repeated for maximum of 6 credits.
- MSW 597. Special Topics** 1-3 cr.
Specific subjects to be announced in the Schedule of Classes. Open to graduate students in related disciplines and to community professionals in related disciplines and to community professionals in related fields. Prerequisite: consent of instructor. May be repeated for unlimited credit under different subtitles.
- MSW 599. Graduate Thesis** 0-6 cr.
Required for thesis option. Prerequisite: consent of instructor. May be repeated for a maximum of 6 credits. Restricted to MSW students.

ADDITIONAL GRADUATE COURSES

A S-ARTS AND SCIENCES

- A S 500. Inquiry-Based Science Education 1-3 cr.
Topics in middle school science education, with emphasis on inquiry-based learning and development of inquiry based learning modules. Prerequisite: consent of instructor. May be repeated for a maximum of 6 credits.

CMI- CREATIVE MEDIA INSTITUTE

- CMI 450. Advanced 2-D Animation 3 cr.
Advanced techniques in two dimensional animation including motion graphics and integration of live action. Prerequisite: CMI 350
- CMI 451. Effects Animation & Dynamic Simulation 3 cr.
Overview of 3D dynamic simulations and effects. Creative projects and practical examples including fluids, particles, fields, soft body, and rigid body techniques. Prerequisites: CMI 260 and permission of instructor.
- CMI 460. Technical Direction for Animation 3 cr.
Principles and practices of current animation technical development. Preliminary and detailed technical design, including advanced rigging, UI customization, Mel scripting, expressions, rendering systems, and pipeline development. LC Campus Only. Prerequisites: CMI 260 and CMI 280 or consent of instructor.
- CMI 470. Short 2-D Animation Production 3 cr.
This is a full-scale animation production class where students will be divided into teams according to the animation skills they have demonstrated in the beginning, intermediate, and advanced classes. Each team member will specialize in one important facet of the production process: character animation, background painting, technical direction, coloring, or story development and storyboarding. 4 to 8 minute animated shorts will be produced. Prerequisite(s): CMI 450, CMI 361.
- CMI 480. Screenwriting II 3 cr.
Students will prepare 30-60 minute screenplays. Script analysis will be in a workshop format. Scripts will be read and discussed, scenes performed and reactions analyzed to consider effect of dialogue, character development, etc. Guest professionals will discuss their experience/expertise. Prerequisite(s): ENGL 309 or CMI 309 or THTR 306 or consent of instructor. Crosslisted with: ENGL 480
- CMI 490. Advanced Screenwriting 3 cr.
Students will prepare a feature-length screenplay. Script analysis will be in an advanced workshop format. Scripts will be read and discussed, scenes performed and reactions analyzed to consider effect of dialogue, character development, etc. Aimed at preparing writers for the professional market. Consent of instructor required. Crosslisted with: ENGL 491
- CMI 495. Internship 1-3 cr.
Placement in a production facility and supervised experience. Required. With CMI advisor approval only.
- CMI 496. Media Law/Ethics 3 cr.
Overview of legal & ethical issues in creative media elements of business and commercial law. This class will focus on the fundamentals of entertainment law by exploring the business and legal relationships within film industries, and animation. Learn to anticipate and avoid legal problems prior to production. Key issues in the area of copyright law, sources of financing, distribution agreements; insurance and union consideration will be discussed. Prerequisite(s): CMI 100. Restricted to CMI majors.
- CMI 497. Portfolio Design and Development 3 cr.
Advanced graphic design projects with an emphasis on conceptual development, portfolio preparation, and professional practices. Refine general marketing strategies, personal portfolio, and resumes. Define, target, and penetrate personal target markets. Students develop individual promotional/demo packages. Prerequisites: Consent of instructor.
- CMI 498. Final Year Senior Project I: Production and Post Production 3-6 cr.
Senior thesis will be a yearlong concentration on a project guided by more than one faculty member. Will be narrative-driven and have an end

product; short film, documentary, experimental 3-D animated short, or pilot and treatment for a TV series. Emphasis will be on preproduction. Student will produce a professional quality product that will help gain entry into a professional situation or graduate school. Prerequisite(s): Consent of instructor.

- CMI 499. Final Year Senior Project II: Production and Post Production 3-6 cr.
The senior thesis will be a year long concentration on a project guided by more than one faculty member. Will be narrative driven and have an end product; short film, documentary, experimental, 3-D animated short, or pilot and treatment for a TV series. Student will produce a professional quality product that will help gain entry into a professional situation or graduate school. Consent of instructor required. Prerequisite(s): CMI 498 and Consent of Instructor.

CHSS- COMMUNITY HEALTH AND SOCIAL SERVICES

- CHSS 460. Health Disparities and Health Interventions 3 cr.
Exploration of culturally adapted health intervention strategies designed to address health disparities.
- CHSS 470. Creation and Use of Media for Health and Social Services 3 cr. (2+2P)
Basic application and creation of media products in health and social services. Two hours of lectures plus two hours lab each week. Prerequisite: consent of instructor. Restricted to HL S, BSN, BSNC, BSNR and HCS majors.

DANC- DANCE

- DANC 450. Special Topics 1-3 cr.
Specific subjects to be announced in the Schedule of Classes. Prerequisite: consent of instructor.
- DANC 451V. World Dance 3 cr.
Examination of dance forms from a cross-cultural perspective, focusing on the role of dance in different cultures around the globe. Same as HON 347V.
- DANC 460. Dance History 3 cr.
History and development of dance forms from ancient cultures to today.
- DANC 465. Senior Culminating Experience 1-6 cr.
Exit course for graduating seniors. Students will apply comprehensive knowledge of performance and production and/or pedagogy experience, to culminate in a dance production and/or teaching project. Restricted to majors and minors. A minimum of 2 credit hours required for graduation.
- DANC 466. Dance Pedagogy II 3 cr.
Teaching methods and class planning for dance curriculum at middle school and high school levels. Course must be passed with a grade of C or higher. Consent of instructor required. Prerequisite(s): DANC 300 or consent of instructor.
- DANC 489. Advanced Choreographic Project 3 cr.
Individual directed studies in choreography with a culminating performance. Consent of instructor required. Restricted to Grad Dance Students majors.
- DANC 499. Problems 1-3 cr.
Problems in dance education, dance pedagogy, dance performance and independent work in their solutions. Prerequisite: consent of instructor. May be repeated for a maximum of 6 credits. Restricted to majors and minors.
- DANC 501. Directed Studies 1-6 cr.
Supervised projects and/or research in theoretical studies, inclusive of community service projects. Consent of instructor required.
- DANC 505. Dance Ensemble III 3 cr.
Rehearsal and performance of dance repertory with emphasis on advanced understanding of musicality, dynamic phrasing, artistic expression, and athletic versatility within a broad range of styles. Consent of instructor required.

- DANC 550. Special Topics** 1-6 cr.
Specific subjects offered in addition to standard academic curriculum. Course title to be announced in the Schedule of Classes. Consent of instructor required.
- DANC 551. Movement as Social Text** 3 cr.
Investigation of the meaning of movement and dance in different cultural, social, and historical contexts in both Western and non-Western dance forms. Emphasis will be placed on the nature of movement, its unique properties, the ways in which it conveys meaning, and its relationship to culture and society. Consent of instructor required.
- DANC 567. Dance Internship I** 3 cr.
Internship opportunities in either dance education, dance performance/production, or dance administration. Internship site determined by both Director of Dance Program and graduate student.
- DANC 568. Advanced Theory of Dance Technique** 1-6 cr.
Advanced study of dance pedagogy, theory and practice of dance technique in one of the following styles of dance: ballet, modern, jazz, ballroom, Latin, tap, flamenco, ballet folklorico, or Spanish dance.
- DANC 570. Dance Administration and Leadership** 3 cr.
The study and investigation of both management and leadership theories and how to apply these theories in practice.
- DANC 599. Master's Thesis** 3 cr.
This course is for graduate dance students who choose to write a thesis instead of a performance or teaching project.
- DANC 600. Dance Research** 3 cr.
Literature review and development of research in the field of dance.
- DANC 670. Dance Internship II** 3 cr.
Internship opportunities in either dance education, dance performance/production, or dance administration. Internship site determined by both Director of Dance Program and graduate student.
- DANC 700. Doctoral Dissertation** 3 cr.
This course is for graduate dance students working toward their EdD or PhD in dance. A dissertation is required. Topic and format to be determined by dissertation committee chair and graduate student. Consent of instructor required. Restricted to Graduate Dance Majors majors.

E T- ENGINEERING TECHNOLOGY

- E T 454. Advanced Construction Technology** 3 cr.
Contractor design and construction methods concerning formwork, special foundations, shoring, excavations, pilings, steel erection, and various material handling components. Prerequisite: E T 354 and E T 355.
- E T 455. Cost Estimating and Scheduling** 3 cr.
Methods and techniques in construction estimating including final bid preparation, construction planning and scheduling using various network methods and other techniques. Prerequisite: junior or senior standing in E T.
- E T 456. Analysis of Physical Security Systems** 3 cr.
The design, analysis and implementation of security systems and subsystems including threat detection and response, information and communications security, and physical protection. Prerequisite: junior standing.
- E T 457. Introduction to Information Security Technology** 3 cr.
Practical techniques of Data Encryption Technology, Steganography for Information Technology, Intrusion Detection and Countermeasures. Use of Python to write system tools for detecting anomalies in data flow. Design of physically secure data housing. Techniques of Industrial Espionage. Hiding and Finding of secrets in the field. Dead Drops, design of Fake ID's. Use of PGP and other public encryption methods. Using DNS tools to track down hackers. Hiding of information in music and other audio files. Prerequisite(s): E T 362 and E T 377.
- E T 458. Database Technology for Engineering** 3 cr.
Using SQL in a Tomcat (Java Servlet oriented) environment. Data conversion using Python and line editing for Engineering Technology departments. Methods of transferring data from electronic boards and data feeds, into databases. Use of SQL in java programming. Remote programming of computers for running database systems in a mixed OS environment. Generation of web pages directly from Database queries. Prerequisite(s): E T 362.
- E T 462. Remote Access Operating Systems and Advanced Scripting** 3 cr.
Concepts relating to operating systems applications and interfacing with an introduction to systems administration. Scripting using Python and Unix. Design and control of Web servers using CGI programming. Prerequisite(s): E T 362.
- E T 463. Computer Systems Administration** 3 cr.
A continuation of topics in computer systems administration from E T 462. Prerequisite(s): E T 462 and E T 255.
- E T 464. Advanced Windows Server Administration** 3 cr.
Learn about configuration and maintenance of programs in Windows Server such as Microsoft SQL Server, Microsoft Exchange, Oracle, DHCP, DNS, Apache WebServer, Tomcat Server, Load Balancing, Backups, File Sharing, Remote Administration and more. Prerequisite(s): E T 458 and E T 462.
- E T 468. Applications of Electronic Devices** 3 cr. (2+3P)
Study of the applications of analog and digital devices as they are commonly used in data acquisition systems. Includes basic construction and diagnostic skills. Prerequisite: senior or graduate standing.
- E T 469. Data Acquisition and Computer Interfacing** 3 cr. (2+3P)
Survey of computers and associated hardware available to the research community. Includes practical digital signal processing methods and an overview of transducers. Prerequisites: senior or graduate standing and E T 468 or consent of instructor.
- E T 470. Data Analysis and Acquisition** 3 cr. (2+3P)
The use of hardware and software to establish a unified and efficient data collection and analysis system. Prerequisites: senior or graduate standing and E T 469 or consent of instructor.
- E T 472. Intelligent Transportation Systems (ITS)** 3 cr.
Traffic flow theory, telecommunication and information technology application in transportation, system architecture and standards, transportation management, incident and emergency management, corridor management, dynamic route guidance, in-vehicle systems, and traffic signal timing. Consent of instructor required.
- E T 477. Computer Networking II** 3 cr.
Advanced concepts in computer network design and applications including managing the campus network, virtual LANs (VLAN), network security, wireless networks, high-speed optical networks, voice over IP, and Linux networking. Prerequisite(s): E T 377.
- E T 479. Developing and Managing Educational Networks** 3 cr.
For educators who plan to manage technology resources in schools. Focuses on operating systems, network capabilities and management, connections and transfer of files between different computer platforms, and managing peripheral devices. Prerequisite: EDUC 568 or consent of instructor. Same as EDLT 529.
- E T 480. Design and Problem Solving in Engineering and Technology** 3 cr.
Development of problem-solving and critical-thinking abilities through design, analysis, and implementation of projects in selected areas of technology and engineering. Intended for mathematics, science, and technology educators. Prerequisite: consent of instructor. May be repeated for a maximum of 6 credits.
- E T 482. Concepts in Computer Integrated Manufacturing** 3 cr. (2+2P)
Current manufacturing concepts regarding the data, hardware, and software necessary for a computer integrated manufacturing system. Prerequisites: senior standing and consent of instructor. Same as I E 482 and M E 482.
- E T 490. Selected Topics** 1-3 cr.
Selected topics in engineering technology and related areas. Prerequisite: consent of instructor.

FREN- FRENCH

- FREN 451. Special Topics in French** 1-3 cr.
Selected topics relating to the cultures or literatures of the countries where French is spoken will be announced in the Schedule of Classes. Prerequisite: consent of instructor. May be repeated for a maximum of 12 credits.
- FREN 453. Independent Studies in French** 1-3 cr.
Individualized, self-paced, projects for advanced students. Prerequisite: consent of instructor. May be repeated for a maximum of 6 credits.
- FREN 462. Advanced Contemporary French Culture** 3 cr.
Advanced study of institutions, lifestyles and popular attitudes in modern France. Emphasis on everyday life rather than prestigious monuments in civilizations. Prerequisite: FREN 212 or consent of instructor.
- FREN 471. The French Novel** 3 cr.
Development of the novel and analysis of selected texts with emphasis on the nineteenth and twentieth centuries. Prerequisite(s): FREN 212 or consent of instructor.
- FREN 472. The French Short Story** 3 cr.
Study and discussion of French short stories through the ages. Prerequisite(s): FREN 212 or consent of instructor.
- FREN 478. Studies in Francophone Cultures Around the World** 3 cr.
Advanced studies of representative Francophone cultures through their history, literature, music, and films. Prerequisite(s): FREN 212 or consent of instructor.
- FREN 480. Contrastive Stylistics of the French and English Languages** 3 cr.
Close analysis of convergences and divergences of the two languages in vocabulary, syntax and style. Initiation to literary translation. Prerequisite:

FREN 212 or consent of instructor.

FREN 485. Advanced French Civilization 3 cr.
Advanced study of important events in French civilization from its origins to the twentieth century through the study and discussion of history, literature, fine arts and politics. Prerequisite(s): FREN 212 or consent of instructor.

FREN 486. Advanced Contemporary Women Writers in French 3 cr.
Advanced study of literary texts by contemporary women writers in France and the Francophone world; emphasizes the cultural contexts that have defined women's relationship to writing. Selections will vary from year to year. Prerequisite(s): FREN 212 or consent of instructor.

G S- GRADUATE SCHOOL COURSES

G S 500. Masters Non-Thesis Final Exam Credit 1 cr.
Course for non-thesis masters students who have completed all program requirements except the final comprehensive exam. Prerequisites: advisor signature required. A maximum of 12 credits may be earned. Graded S/U.

G S 599. Master's Thesis 0-88 cr.
Thesis.

G S 600. Doctoral Research 1-88 cr.
Course number is used for assigning credit for research performed prior to successful completion of the doctoral comprehensive examination.

G S 700. Doctoral Dissertation 0-88 cr.
Dissertation.

GER- GERMAN

GER 451. Special Topics in German 1-3 cr.
Selected topics in German language, literature, or area studies, announced in Schedule of Classes. May be repeated for credit when topic changes. Prerequisite: consent of instructor. May be repeated for a maximum of 12 credits.

GER 453. Independent Studies in German 1-3 cr.
Individualized, self-paced projects, for advanced students. Prerequisite: consent of instructor. May be repeated for a maximum of 6 credits.

GER 466. Theatre Workshop in German 3 cr.
Seminar. Practical exercise in dramatic interpretation, also play production. Prerequisite: GER 212 or consent of instructor. May be repeated for a total of 6 credits.

ICT- INFORMATION AND COMPUTER TECHNOLOGY

ICT 450. Advanced Topics in Information and Communication Technology 3 cr.
Addresses the latest advances and topics in information and communication technology. Prerequisite(s): ICT 362.

ICT 456. Analysis of Physical Security Systems 3 cr.
The design, analysis and implementation of security systems and subsystems including threat detection and response, information and communications, security, and physical protection. Prerequisite(s): junior standing.

ICT 457. Introduction to Information Security Technology 3 cr.
Practical techniques of Data Encryption Technology, Steganography for Information Technology, Intrusion Detection and Countermeasures. Use of Python to write system tools for detecting anomalies in data flow. Design of physically secure data housing. Techniques of Industrial Espionage. Hiding and finding of secrets in the field. Dead drops, design of Fake ID's. Use of PGP and other public encryption methods. Using DNS tools to track down hackers. Hiding of information in music and other audio files. Prerequisite(s): ICT 377 or E T 377.

ICT 458. Database Design and Applications 3 cr.
Using SQL in a Tomcat (Java Servlet oriented) environment. Data conversion using Python and line editing for Engineering Technology departments. Methods of transferring data from electronic boards and data feeds, into databases. Use of SQL in java programming. Remote programming of Computers for running database systems in a mixed OS environment. Generation of web pages directly from Database queries. Prerequisite(s): ICT 362 or E T 362.

ICT 460. Advanced Topics in Multimedia Technologies 3 cr.
Addresses the latest multimedia technology advances and how they apply to the information and communication technology fields. Prerequisite(s): ICT 362 or E T 362.

ICT 462. Remote Access Operating Systems 3 cr.
Concepts relating to operating systems applications and interfacing with an introduction to systems administration. Setup and control of web servers and all common UNIX tasks. Prerequisite(s): ICT 362 or E T 362.

ICT 463. Computer Systems Administration 3 cr.
A continuation of topics in computer systems administration from ICT 462. Prerequisite(s): ICT 462 or E T 462.

ICT 477. Computer Networking II 3 cr.
Advanced concepts in computer network design and applications including managing the campus networks, virtual LANs (VLAN), network security, wireless networks, high-speed optical networks, voice over IP, and Linux networking. Prerequisite(s): ICT 377 or E T 377.

JPNS- JAPANESE

JPNS 453. Independent Studies in Japanese 1-3 cr.
Individualized, self-paced projects for advanced students.

JOUR- JOURNALISM AND MASS COMMUNICATION

JOUR 460. Public Relations Promotion in Sports 3 cr.
Examination of sports as a business and how public relations promotion is executed in professional sports franchises.

JOUR 476. Public Relations Cases and Problems 3 cr.
The study and solving of problems in the mass media industry. Prerequisite: JOUR 374.

JOUR 482. Broadcast Business and Regulation 3 cr.
Station organization and management of commercial and public radio and television; FCC regulations; programming, sales, ratings.

JOUR 484. Public Opinion 3 cr.
Seminar on forces which help form public opinion; individual projects in attitude measurement; measuring effectiveness of mass communication.

JOUR 489. Mass Media Research 3 cr.
Examination of the role of empirical research in solving mass communication problems. Survey techniques, field studies, content analysis, data analysis.

JOUR 490. Advertising Campaigns 3 cr.
Capstone course utilizing all previous instruction to create and develop plans for a long-term national or local advertising campaign. Consent of instructor required. Prerequisite(s): JOUR 300 and 312 or consent of instructor.

JOUR 493. Mass Communications Law 3 cr.
Examination of legal issues relating to mass media in the United States. Invasion of privacy, libel, sedition, copyright, and advertising regulation. Same as COMM 493, GOVT 493.

JOUR 494. Special Topics 3 cr.
Specific subjects to be announced in the Schedule of Classes.

JOUR 499. Independent Study in Mass Communications 1-3 cr.
Individual study directed by consenting instructor with prior approval of department head. Prerequisites: 2.5 GPA and consent of instructor. May be repeated for a maximum of 6 credits.

LANG- LANGUAGES

LANG 451. Special Topics 1-3 cr.
Selected topics relating to cultures or literatures of a specific country. Prerequisite: consent of instructor. May be repeated for a maximum of 12 credits.

LANG 453. Independent Studies 1-3 cr.
Individualized, self-paced projects for advanced students. Prerequisite: consent of instructor. May be repeated under different subtitles for a maximum of 6 credits.

LING-LINGUISTICS

LING 451. Independent Studies in Linguistics 1-3 cr.
Individual or group study of selected topics. To be identified by subtitle. Prerequisites: LING 200G and prior arrangement with faculty supervisor. May be repeated for a maximum of 6 credits.

LING 500. Introduction to Linguistics 3 cr.
Survey of the main branches of linguistics: phonology, morphology, syntax, semantics, language acquisition, sociolinguistics, historical linguistics, and some of the theoretical issues in the field.

LING 501. Introduction to Psycholinguistics 3 cr.
Students will be responsible for all requirements of LING 301 and will undertake independent directed research. Prerequisite: PSY 201G. Same as PSY 501.

LING 502. Graduate Study in Sociolinguistics 3 cr.
Study of how social identity, including factors such as ethnicity, age, gender, education, and socio-economic class is expressed in language systems. Prerequisites: LING 200G or LING 500 recommended.

LING 503. Exploring Language Systems- Grad 3 cr.
Students will be responsible for all requirements of LING 303 and will undertake independent directed research. Prerequisite(s): LING 200 or LING 500.

- LING 505. Selected Topics 3 cr.
Studies, varying from year to year, in linguistics.

M SC- MILITARY SCIENCE

- M SC 465. Leading Small Organization - Graduate Level 3 cr.
Practical opportunities to lead small groups in situations of graduated complexity. Use of small unit defensive tactics and opportunities to conduct training for graduate students. Leader Lab M SC 465L, three physical fitness sessions per week and weekend exercises required. Research paper required. Prerequisite: consent of PMS. Corequisite: MSC 465L. No S/U option.
- M SC 465 L. Advanced Course Leadership Lab - Graduate Level 1 cr.
Planning, coordination, execution and evaluation of training and activities with basic course students and ROTC program. Students develop and refine leadership skills in positions of responsibility. Open only to students taking MSC 465. Prerequisite: consent of PMS. Corequisite: MSC 465.
- M SC 466. Graduate-Level Leading Small Organizations 3 cr.
Open only to students taking M SC graduate-level courses. Delegation and supervision based on case studies. Use of ethical decision making to enhance team performance. Three physical fitness sessions per week, weekend exercises, and a research paper required. Prerequisite: consent of PMS. Corequisite: M SC 466L.
- M SC 466 L. Graduate-Level Leading Small Organizations Lab 1 cr.
Open only to students taking M SC graduate-level courses.
- M SC 501. Leadership Challenges and Goal Setting 3 cr. (3+1P)
Planning, conducting, and evaluating activities of ROTC cadet organization. Articulation of goals and plans to attain them. Assessment of organizational skills and development of strategies to improve group cohesion. Leadership lab, three physical fitness sessions per week, weekend exercise, and research paper required. Consent of instructor required. Prerequisite(s): Consent of PMS. Corequisite(s): M SC 401L.
- M SC 502. Transition to Lieutenant 3 cr. (3+1P)
Continuation of M SC 501. Identification and resolution of ethical dilemmas. Counseling and motivation techniques. Examination of tradition and law for officers. Leadership lab, three physical fitness sessions per week, weekend exercises, and research paper required. Consent of instructor required. Prerequisite(s): Consent of PMS. Corequisite(s): M SC 402L.

PHIL- PHILOSOPHY

- PHIL 463. Independent Studies 1-3 cr.
For students with a strong background in philosophy. Independent work in a specific area. Prerequisite: consent of instructor. May be repeated for a maximum of 6 credits.
- PHIL 532. Advance Studies in Ethics and Global Poverty 3 cr.
Advanced philosophical scrutiny of and moral reflection on various aspects of global poverty and foreign aid. For example: Is poverty fundamentally a lack of income, or can it be understood as a failure to meet basic needs, or as a lack of valuable freedom? Do human rights exist? What, if any, are the moral obligations of rich countries to poor countries? Can foreign aid be immoral? How should the answers to these questions influence public policy?
- PHIL 540. Science and Ethics 1-3 cr.
Ethical concerns facing researchers in the basic and applied biological sciences. Coverage of responsible conduct in research including scientific integrity and research misconduct, mentor/trainee responsibilities, data management, authorship, publication practices, human subjects, animal welfare, intellectual property, conflicts of interest and effort and collaborative science. Emphasis on ethical reasoning skills. Discussion of ethical and societal implications of issues selected from a broad range of contemporary research areas (genetics, reproductive biology, environmental sciences, nanoscience, drug discovery, bioengineering, neuroscience). Subtitled. May be repeated for a maximum of 12 credits.
- PHIL 548. Advanced Philosophical Writing 3 cr.
Advanced workshop on writing philosophy papers. Includes how to read and understand philosophical writing, organize a paper effectively, present a clear and forceful argument, and avoid common mistakes. Prerequisite(s): completed 18 hours of philosophy credit.

PE P- PROFESSIONAL PHYSICAL EDUCATION

- PE P 455. Adapted Physical Education 3 cr.
Selection and scope of corrective activities in posture and body mechanics, and the adaptation of movement activities for the exceptional student. Prerequisite: junior or senior standing.
- PE P 465. Senior Seminar 1 cr.
Capstone course for physical education. Prerequisite: senior standing. Graded S/U.

- PE P 466. Methods of Teaching Secondary Physical Education 6 cr.
Theoretical and practical applications of curriculum, pedagogy and assessment for teaching secondary physical education. Provides the students opportunities to develop curriculum, teach, and assess student learning through a supervised practicum in both middle and high school physical education settings. Consent of instructor required. Prerequisite(s): PE P 315 and admittance to TEP required.
- PE P 499. Problems 1-3 cr.
Problems in physical education and recreation and independent work in their solutions. A maximum of 3 credits during any one semester and a grand total of 6 credits. Prerequisites: senior standing and consent of instructor.
- PE P 501. Special Topics 1-3 cr.
Offered under various subtitles that indicate the subject matter. May be repeated for a maximum of 3 credits per semester and a total of 6 credits overall.
- PE P 504. Teaching Processes in Physical Education 3 cr.
Analysis of effective teaching and coaching. Systematic observation strategies will be employed to evaluate instructional variables such as feedback, climate, academic learning time, and styles of teaching.
- PE P 509. Biomechanics 3 cr.
Mechanical and anatomical considerations applied to the analysis and teaching of human motion. Consent of instructor required. Prerequisite(s): SP M 305 or SP M 371 or consent of instructor.
- PE P 545. Skill Acquisition and Performance 3 cr.
Behavioral and physiological examination factors that influence the acquisition and performance of motor skills.
- PE P 550. Advanced Topics in Physical Education 1-4 cr.
Advanced study in teaching processes, perceptual motor development, bioenergetics, biomechanical instrumentation, psychological bases of performance, or motor control.
- PE P 551. Sociology of Sports 3 cr.
- PE P 555. Adapted Physical Education 3 cr.
Selection and scope of corrective activities in posture and body mechanics, and the adaptation of movement activities for the exceptional student. Prerequisite: consent of instructor. Same as PE P 455 with additional requirements for graduate credit.
- PE P 557. Adapted Physical Education : A Practitioner's Approach 3 cr.
Preparation for qualified physical education professionals to teach individuals with disabilities motor and fitness skills. Knowledge of the Adapted Physical Education National Standards is developed so students may become nationally certified in the field. The inclusion of disability sports into general physical education curriculum is also major emphasis of this course. Prerequisites: PE P 455 and PEP 555 or PE P 456 and PE P 556.
- PE P 558. Adapted Physical Education National Standards (APENS) Professional Preparation 3 cr.
This distance education course is to prepare physical education teachers to pass the Certified Adapted Physical Education (CAPE) National Examination, which is based on the Adapted Physical Education National Standards (APENS). These standards were developed by professionals in the field to ensure that physical education instruction for students with disabilities is provided by qualified physical education teachers.

PORT- PORTUGUESE

- PORT 451. Special Topics in Luso-Brazilian Studies 3 cr.
Selected topics relating to Luso-Brazilian cultures and literatures. Topic to be announced in the schedule of classes. Prerequisite: Consent of instructor.
- PORT 453. Independent Luso-Brazilian Studies 1-3 cr.
Individualized, self-paced projects for advanced students in Luso-Brazilian studies.
- PORT 513. Graduate Portuguese for Romance Language Students I 3 cr.
Portuguese for beginners at the graduate level. May be completed on campus or via Study Abroad. Credit can be applied towards fulfilling the second language requirement. Credit is not accepted towards any graduate level major or minor.
- PORT 514. Graduate Portuguese for Romance Language Students II 3 cr.
Portuguese for beginners at the graduate level. May be completed on campus or via Study Abroad. Credit can be applied towards fulfilling the second language requirement. Credit is not accepted towards any graduate level major or minor. Prerequisite(s): Language placement exam or C or better in PORT 513, or consent of instructor.

PDC- PROFESSIONAL DEVELOPMENT CREDIT

- PDC 503.** Professional Development Credit in Educational Technology 1-6 cr.
Special topics course in educational technology covering professional development for educators to support the improvement of professional practice in schools. Recommended that this course not be accepted for licensure. May be repeated for a maximum of 12 credits. S/U only.
- PDC 801.** Introduction to Postdoctoral Training in Psychopharmacology for Psychologists 4 cr.
Course I provides the basic understanding of neurology, physiology, and pharmacy as needed to understand the applications of psychotropics in the treatment of emotional disorders. Course taught in the Weekend College format over three sessions. Prerequisite: consent of instructor. Graded S/U.
- PDC 802.** Postdoctoral Training in Pharmacodynamics and Pharmacokinetics for Psychologists 4 cr.
Course II provides advanced training in the diagnosis of emotional disorders and selection of appropriate medications to assist in treatment. Course taught in the Weekend College format over three sessions. Prerequisite: consent of instructor. Graded S/U.
- PDC 802.** Postdoctoral Training in Pharmacodynamics and Pharmacokinetics for Psychologists 4 cr.
Course II provides advanced training in the diagnosis of emotional disorders and selection of appropriate medications to assist in treatment. Course taught in the Weekend College format over three sessions. Prerequisite: consent of instructor. Graded S/U.
- PDC 804.** Postdoctoral Training in Pathophysiology for Psychologists 4 cr.
Course IV is an applied course in medical and mental history taking. Covers how to measure and record vital signs; how to order and interpret basic laboratory tests; and the bases for ruling out underlying medical conditions. Includes a practicum in a clinic setting. Course taught in the Weekend College format over four sessions plus practicum time. Prerequisite: consent of instructor. Graded S/U.
- PDC 808.** Pathophysiology and Treatment of Substance Dependence Disorders 4 cr.
Etiology of various substance addictions is studied, then multimodal means of interventions are presented. Prerequisite: consent of instructor. Graded S/U.
- PDC 809.** Special Topics in Psychopharmacological Treatment 4 cr.
Current issues such as new medications, changes in diagnostic procedures, and ethical/legal concerns. Prerequisite: consent of instructor. Graded S/U.
- PDC 810.** Preceptorship 3-6 cr.
Students will work under the close supervision of a physician with expertise in psychopharmacology, treating 100 patients for 400 hours in relevant settings. Prerequisite: consent of instructor. Restricted to C EP majors. May be repeated for a maximum of 6 credits.

SP M- SPORTS MEDICINE

- SP M 451.** Advanced Exercise Physiology 3 cr.
Detailed study of the integrated response of neuromuscular, cardiovascular, and respiratory systems to acute and chronic exercise, nutrition, and environmental conditions with a strong emphasis on laboratory experiences. Prerequisite(s): SP M 271 and SP M 308 or consent of instructor.
- SP M 456.** Exercise for Special Populations 3 cr.
Fundamentals of kinesiology adapted for adults with various diseases and disabilities. Focus will be on the application of exercise assessment and prescription for selected conditions. Prerequisite(s): SPM 308 and SPM 330 or SPM 460.
- SP M 458.** Physical Dimensions of Aging 3 cr.
This course introduces students to physical, physiological, social, mental, and emotional aspects of human aging. Age-related changes in human function are discussed the context of applied healthcare settings, and the implications for appropriate physical activity and functional independence. Prerequisite(s): SP M 308.
- SP M 460.** Principles of Strength and Conditioning 3 cr.
Application of research, theory, and methods of high-intensity, resistive overload training. Performance-specific topics include management, nutrition. Prerequisite(s): SPM 308.
- SP M 460 L.** Principles of Strength and Conditioning Laboratory 1 cr. (2P)
An applied examination of the theory, principles, rules and regulations associated with various strength and conditioning exercises to include but not limited to Olympic lifting, powerlifting, bodybuilding, plyometrics, speed, agility and speed-endurance development. Lab required for Kinesiology majors. Prerequisite(s): SPM 308.
- SP M 499.** Topics in Athletic Training 1-3 cr.
Problems in athletic training and independent work in their solutions. Consent of instructor required. Prerequisite(s): Junior or Senior status; Consent of ATEP director.

- SP M 505.** Psychology of Sport II 3 cr.
Application of psychology in coaching and teaching sport skills to optimize athletic performance. Skills in understanding and conducting research emphasized. Consent of instructor required. Prerequisite(s): PE P 304 or consent of instructor.
- SP M 509.** Biomechanics 3 cr.
Mechanical and anatomical considerations applied to the analysis and teaching of human motion. Consent of instructor required. Prerequisite(s): Either PE P 305 or SP M 371 or consent of instructor.
- SP M 512.** Inferential Statistics in Sports and Exercise Science 3 cr.
A graduate course designed to teach students how to use and interpret inferential statistics using the scientific method. An understanding of sport and exercise science theory is prerequisite for students wishing to enroll in this course. Consent of instructor required.
- SP M 551.** Advanced Exercise Physiology 3 cr.
Detailed study of the integrated response of neuromuscular, cardiovascular and respiratory systems to acute and chronic exercise, nutrition and environmental conditions with a strong emphasis on laboratory experience. Prerequisite: SP M 308 or consent of instructor. Same as SP M 451 with additional requirements for graduate credit.
- SP M 556.** Exercise for Special Populations 3 cr.
Fundamentals of kinesiology adapted for adults with various diseases and disabilities. Focus will be on the application of exercise assessment and prescription for selected conditions. Taught with PE P 456 with additional work required at the graduate level. Consent of instructor required. Prerequisite(s): SPM 308 and SPM 330 or SPM 460.
- SP M 558.** Physical Dimensions of Aging 3 cr.
This course introduces graduate students to physical, physiological, social, mental, and emotional aspects of human aging. Age-related changes in human function are discussed the context of applied healthcare settings, and the implications for appropriate physical activity and functional independence. Graduate students in this course are expected to participate in organizing and leading some of the class discussions and assisting in the identification of appropriate materials for the course.
- SP M 560.** Principles of Strength and Conditioning 3 cr.
Application of research, theory, and methods of high-intensity, resistance training. Performance-specific topics include management, nutrition, exercise prescription, periodization, lifting techniques, testing, and evaluation. Course will emphasize standards set forth by the National Strength and Conditioning Association preparing students interested in sitting for the NSCA certification examinations. Prerequisites: SP M 305, SP M 308 or consent of instructor. Same as SP M 460 with additional requirements for graduate credit.
- SP M 597.** Project 1-3 cr.
A scholarly project or practicum under the direction of a single faculty person in an area of coaching/teaching or sports management.

THTR- THEATRE ARTS

- THTR 455.** Advanced Lighting Design 3 cr.
The design of lighting for live performance. Emphasis on conceptual aspects of design, as well as the uses of special techniques and effects. Crew requirements TBA. Prerequisite: THTR 355 or consent of instructor.
- THTR 457.** Advanced Computer Scenographics 3 cr.
Project-oriented course for the advanced modeler. Projects focus on the creation of complex models, custom texturing and shading, virtual lighting, postproduction image work, and animation techniques. Students will develop digital portfolios. Prerequisite: THTR 357 and consent of instructor.
- THTR 495.** Directing II 3 cr.
Advanced study of directing, with focus on theory, style, and concept. Prerequisite(s): THTR 395.
- THTR 500.** Introduction to Graduate Theatre Studies 3 cr.
Advanced exploration of the theory, terminology, and integration of the various theatre artists involved in, and aspects of, theatrical practice.
- THTR 510.** Acting Theory and Pedagogy 3 cr.
Study of the basics of Stanislavski acting theory and their application for the teaching and coaching of young actors. Students will be expected to act and coach acting in a studio setting.
- THTR 530.** Dramaturgy 3 cr.
A practical course introducing the graduate student to principles and practices of script selection, analysis, editing, and theatrical research. Prerequisite(s): THTR 500 Intro to Graduate Theatre Studies.
- THTR 535.** Directed Study 1-3 cr.
For the highly motivated student. Independent projects and individual guidance. Graduate standing and consent of instructor required. May be repeated up to 6 credits.

THTR 540. Practical Problems in Theatre Production	3 cr.
Seminar class dealing with issues surrounding theatre production and problem solving strategies for overcoming them.	
THTR 541. Stagecraft & Lightcraft	3 cr.
This course is designed to put into practice the theory from the scenic and lighting design course. Topics covered will include basic tool use, color theory, painting techniques, the hanging and focusing of lighting instruments as well as instrument selection.	
THTR 542. Graduate Costume Craft: Theory and Practice	3 cr.
Graduate study of the techniques and applications of costuming.	
THTR 552. Graduate Costumes: History, Theory and Design	3 cr.
Course focusing on the evolution of fashion through time and the theory of its application for theatrical productions.	
THTR 553. Scenic and Lighting Design	3 cr.
This course is designed to develop an understanding and foundation in the basic tools used in lighting and scenic design. Lighting topics include: electricity, light sources, optics, color theory, instrument types, design styles, history of theatrical lighting and selection of instrumentation for design. Scenic topics include : scenic design history, communications tools designers use, script analysis and design strategies.	
THTR 595. Directing/Producing Theory and Practice	3 cr.
Theoretical and practical applications in directing and producing for the stage.	

WERC-A CONSORTIUM FOR ENVIRONMENTAL EDUCATION AND TECHNOLOGY DEVELOPMENT

WERC 466. Fuel Cell and Hydrogen Technology	3 cr.
Same as CH E 466. Prerequisites: CHEM 111G and PHYS 215G	
WERC 471. Health Physics	4 cr.
Introduction to Radiation Protection, Radiation/Radioactivity, Radioactive Decay/Fission, Interaction of Radiation and Matter, Biological Effects of Radiation, Radiation Measurement/Statistics, Sampling for Radiation Protection Purposes, Radiation Dosimetry, Environmental Transport, Radiation Protection Guidance, External Radiation Protection, Internal Radiation Protection, Waste Management, and Hazards Analysis and Control. Same as CH E 471. Prerequisites: MATH 191G, CHEM 111G.	
WERC 473. Nuclear Regulations and Compliance Practices	3 cr.
Same as CH E 473. Consent of instructor required. Prerequisite(s): MATH 191G and (CHEM 111G or Chem 115). Crosslisted with: CH E 473	
WERC 566. Fuel Cell and Hydrogen Technology	3 cr.
Crosslisted with: CH E 566 with differentiated assignments for graduate students.	
WERC 595. Special Topics	1-3 cr.
Lecture instruction on special topics such as energy, environment and economics. Prerequisite: consent of instructor. May be taken for a maximum of 6 credits.	

W S- WOMEN'S STUDIES

W S 450. Special Topics	3 cr.
The topic of course will vary and will be indicated by subtitle. May be cross-listed with relevant courses at the 400-level from any specific department. May be repeated under different subtitle(s).	
W S 451. Women's Studies Practicum	3 cr.
Supervised field work in community setting relating to women. Prerequisite: consent of instructor. May be repeated for a maximum of 6 credits.	
W S 453. Women and Politics	3 cr.
Same as GOVT 453G.	
W S 454. Women Crossing Borders	3 cr.
Experiences of women who cross class, race, cultural, national, or sexual borders including theories regarding women's Interactions across borders. Emphasis will vary with professor and discipline.	
W S 455. Feminist Research Methods	3 cr.
Feminist research practices and methodologies utilized in various disciplines. Definitions of research, what constitutes valid inquiry, how research can be feminist, and what it means to do interdisciplinary work.	
W S 459. Advanced Issues in Sex and Gender	3 cr.
Same as SOC 459.	
W S 461. Women s Studies: Independent Study	3 cr.
Individual study of selected topic and writing of research paper. Prerequisite: consent of instructor. May be repeated for a maximum of 6 credits.	
W S 463. Communication and Gender	3 cr.
Same as COMM 463.	
W S 465. Sex, Gender and the Body across the Disciplines	3 cr.
Ways in which the body is used to construct identities and boundaries regarding race, gender, and class. Representations of the body across a variety of disciplines in the sciences and the humanities. Prerequisite: None	

W S 468. Global Sexualities	3 cr.
Generates a global context to focus on sexual identity and orientation, sexual identity politics, romantic relationships, patterns of sexual behavior, sexual regulation and the impact of different cultures on individual sexualities. Taught with WS 568. Crosslisted with: SOC 468	
W S 469. Gender and Sexuality in Hispanic Film	3 cr.
The study of gender and sexual orientation issues in relation to identity as portrayed in Hispanic cinema. Taught in Spanish but assignments accepted in English. Crosslisted with: SPAN 469	
W S 471. Seminar in Feminist Theory	3 cr.
Current feminist theory. Topic changes by semester. Course subtitled in the Schedule of Classes. Prerequisite: None	
W S 474. Gender in East Asian History	3 cr.
Same as HIST 474.	
W S 481. Hate Crimes and Hate Groups	3 cr.
Explores the phenomenon of hate-motivated violence. Examines the hate crime laws, organized hate groups and social theories attempting to explain violent hate.	
W S 482. Gender and Popular Culture	3 cr.
Intensive study of the representations of gender in popular culture. Examines the historical, aesthetic, and cultural contexts of these representation and the various critical and theoretical lenses we use to understand them. Repeatable under different subtitles. Crosslisted with: ENGL 482	
W S 484. Women's Literature	3 cr.
Intensive study of literature by women, in particular historical, aesthetic, cultural, or intellectual contexts. Repeatable under different subtitles. Crosslisted with: ENGL 481	
W S 485. Sex Crimes	3 cr.
Dynamics of sex crimes for victims and offenders; plus consideration of the legal correction systems' response to sex crimes. Same as C J 485	
W S 522. Graduate Study in a Literary Form or Genre	3 cr.
Same as ENGL 522.	
W S 533. Advanced Issues in Women, Gender, and Culture	3 cr.
Same as ANTH 533.	
W S 545. Advanced Victimology	3 cr.
Study of the risk factors in crime victimization, the impact of crimes upon victims, and the role of the victim in the criminal justice system, consideration of the impact of criminal justice policy on victim outcomes. Same as C J 545.	
W S 550. Special Topics	3 cr.
The topic of course will vary and will be indicated by subtitle. May be cross-listed with relevant courses at the 500-level from any specific department. May be repeated under different subtitle(s).	
W S 551. Graduate Practicum in Women's Studies	3 cr.
Supervised field work in community setting relating to women. Prerequisite: consent of instructor. May be repeated for a maximum of 6 credits.	
W S 554. Advanced Issues in Women Crossing Borders	3 cr.
Experiences of women who cross class, race, cultural, national, or sexual borders including theories regarding women's interactions across borders.	
W S 555. Advanced Feminist Research Methods	3 cr.
Advanced feminist research practices and methodologies utilized in various disciplines. Definitions of research, what constitutes valid inquiry, how research can be feminist, and what it means to do interdisciplinary work.	
W S 561. Independent Graduate Research in Women's Studies	3 cr.
Individual study of selected topics and writing of a research paper. Prerequisite: consent of instructor. May be repeated for a maximum of 6 credits. Graded S/U.	
W S 567. Global Sexualities	3 cr.
Generates a global context to focus on sexual identity and orientation, sexual identity politics, romantic relationships, patterns of sexual behavior, sexual regulation and the impact of different cultures on individual sexualities. Taught with WS 468. Crosslisted with: SOC 568	
W S 569. Gender and Sexuality in Hispanic Film	3 cr.
The study of gender and sexual orientation issues in relation to identity as portrayed in Hispanic cinema. Taught in Spanish but assignments are accepted in English. Crosslisted with: SPAN 569	
W S 571. Advanced Seminar in Feminist Theory	3 cr.
Current feminist theory. Topic changes by semester. Course subtitled in the Schedule of Classes.	
W S 574. Gender in East Asian History	3 cr.
Same as HIST 474 with differentiated assignments for graduate students. Required for graduate credit.	
W S 582. Gender and Popular Culture	3 cr.
Intensive study of the representations of gender in popular culture. Examines the historical, aesthetic, and cultural contexts of these representation and the various critical and theoretical lenses we use to understand them. Repeatable under different subtitles. Crosslisted with: ENGL 582	
W S 584. Women's Literature	3 cr.
Intensive study of literature by women, in particular historical, aesthetic, cultural, or intellectual contexts. Repeatable under different subtitles. Crosslisted with: ENGL 581	

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CO	Coca Cola Weight Training	468	H-3		PGEL Greenhouses	390	C-2
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	Commodity Barn	170	C-3	PSL	PSL, Anderson Hall	263	D-3
CP	Computer Center	126	E-2		Regents Row	248	E-2
CC	Corbett Center	285	F-2	RH	Rentfrow Gym	211	E-3
WA	Dan W. Williams Hall	60	E-1		Rhodes Hall Residence Center	79	F-1
WX	Dan W. Williams Hall Annex	60A	E-1	SH	Science Hall	391	E-2
	Delta Zeta Sorority	213	F-1		Sheep Barn	194	C-2
DA	Doña Ana CC	341	C-3	SKH	Skeen Hall	551	C-1
DH	Dove Hall	56	E-1		Small Animal Research Lab	246	C-2
ED	Educational Services Building	338	G-2	SP	Speech Building	365	E-1
ECI	Engineering Complex I	363	D-2		Stan Fulton Athletic Center	596	H-4
EA	Equestrian Building	465	C-3	SY	Stucky Hall	282	C-3
	Equine Education Center	588	C-3	SHC	Student Health Center	261	E-2
OFS	Facilities and Services	221	F-4		Sugerman Space Grant Building	212	C-2
FD	Fire Station	267	F-4		Sutherland Village	206	D-4
FC	Food Court	262	E-2	HB	Swine Barn	196	B-2
	Football Team Building	612	H-3	AE	Tejada Building	245	C-2
EC3	Foreman Engineering Complex	541	D-2	TNC	Tennis Center	601	H-4
FH	Foster Hall	34	D-2	TS	Theatre Scene Shop	385	G-4
GX	Garcia Annex	154	F-2	TB	Thomas & Brown Hall	301	D-2
GH	Garcia Hall Residence Center	275	G-1		Tom Fort Village	214	E-4
GN	Gardiner Hall	188	E-1		Univ. Comm & Marketing Services	248	E-2
	Garrett Hall Residence Center	80	F-1		Vista Del Monte	462	E-5
GC	Genesis Center	394	F-5	WH	Walden Hall	276	D-2
GT	Gerald Thomas Hall	244	C-2	WE	Wells Hall	355	G-4
GO	Goddard Hall	10	D-2	WCHC	William Conroy Honors Center	35	D-1
	Greek Complex	271	G-4		Wind Tunnel	371	F-5
	Guthrie Annex	58	E-1		Wooton Hall	585	C-2
GU	Guthrie Hall	288	E-1	YH	Young Hall	32	E-2
HH	Hadley Hall	172	D-1		Zeta Tau Alpha Sorority	163	F-1
	Hamiel Hall Residence Center	185	F-1	ZL	Zuhl Library	461	E-2
HA	Hardman Hall	323	E-2				
HSS	Health & Social Services	590	E-1				

BUILDING NUMBER INDEX

(Building numbers are state identification numbers)

#	ACR.	BUILDING NAME	GRID	#	ACR.	BUILDING NAME	GRID
10	GO	Goddard Hall	D-2	278	BL	Branson Library.....	E-2
30	AI	Ag. Institute/Police/Parking	B-1	282	SY	Stucky Hall.....	C-3
32	YH	Young Hall.....	E-2	284	PAC	Pan American Center	H-1
33	KH	Kent Hall	E-1	285	CC	Corbett Center.....	F-2
34	FH	Foster Hall.....	D-2	287	OH	O'Donnell Hall	D-3
35	WCHC	William Conroy Honors Center	D-1	288	GU	Guthrie Hall	E-1
36		Nason House.....	D-1	290		Feeding Research	C-3
44		Alumni/Zuhl Collections.....	B-1	301	TB	Thomas & Brown Hall.....	D-2
56	DH	Dove Hall.....	E-1	317		Tombaugh Observatory	E-4
58		Guthrie Annex.....	E-1	320		Flammable Storage	G-4
60	WA	Dan W. Williams Hall	E-1	321	AC	Activity Center.....	F-3
79		Rhodes Hall Residence Center	F-1	323	HA	Hardman Hall.....	E-2
80		Garrett Hall Residence Center	F-1	329		Biological Control Insectary.....	C-2
82	BX	Biology Annex.....	E-2	330	NMDA	NM Dept. of Agriculture	C-3
83	MH	Milton Hall.....	E-2	338	ED	Educational Services Center	G-2
126	CP	Computer Center	E-2	341	DA	Doña Ana CC	C-3
154	GX	Garcia Annex	F-2	342		Memorial Stadium Locker Rooms	H-3
161		Memorial Tower	E-1	343		Air Test Facility.....	F-5
163		Zeta Tau Alpha Sorority	F-1	347		Animal Care Facility	E-4
164	NH	Neale Hall.....	C-2	355	WE	Wells Hall	G-4
166		Livestock Office	C-3	357	TR	DACC Trades Building.....	C-4
170		Commodity Barn	C-3	363	EC I	Engineering Complex I	D-2
172	HH	Hadley Hall	D-1	364	EN	Clara Belle Willams Hall.....	E-1
179		O'Loughlin House.....	D-1	365	SP	Speech Building.....	E-1
184	BD	Breland Hall.....	F-2	368	KN	Knox Hall.....	C-2
185		Hamiel Hall Residence Center	F-1	371		Wind Tunnel	F-5
187	CB	Chemistry.....	D-1	372		Metabolism & Physiology Lab	C-2
188	GN	Gardiner Hall	E-1	373		Motor Pool.....	F-4
189	JH	Jett Hall	D-2	375		Animal Science Shop.....	C-2
190		Jett Annex	D-2	376		Cattle Feed Barn.....	C-2
193		Bull Barn.....	C-3	381		Departmental Storage	F-5
194		Sheep Barn	C-2	382		Departmental Storage	F-5
195	LJ	Livestock Judging Pavilion.....	C-2	384		Departmental Storage	F-5
196	HB	Swine Barn.....	B-2	385	TS	Theatre Scene Shop	G-4
198		Hay Barn	C-2	386	BC	Business Complex	E-1
199		Farm Residence.....	C-3	387		Cervantes Village.....	E-5
206		Sutherland Village.....	D-4	389	MC	Music Building	D-1
211	RH	Rentfrow Gym.....	E-3	390		PGEL Greenhouses	C-2
212		Sugerman Space Grant Building	C-2	391	SH	Science Hall.....	E-2
213		Delta Zeta Sorority.....	F-1	394	GC	Genesis Center	F-5
214		Tom Fort Village	E-4	397	EC2	Hernandez Hall	D-2
221	OFS	Facilities and Services	F-4	412	AR	Academic Research	F-5
222		Warehouse.....	F-4	434		Feed Storage	C-3
225	AY	Astronomy.....	E-2	461	ZL	Zuhl Library	E-2
244	GT	Gerald Thomas Hall	C-2	462		Vista Del Monte.....	E-5
245	AE	Tejada Building	C-2	467	BW	Housing Warehouse	G-4
246		Small Animal Lab	C-2	468	CO	Coca Cola Weight Training	H-3
248		Regents Row.....	E-2	471		Aggie Express Store	E-5
249	TH	Hershel Zohn Theatre.....	E-2	536		Recycling Center.....	F-4
250	JA	Jacobs Hall	E-2	541	EC3	Foreman Engineering Complex.....	D-2
251	NA	Natatorium.....	F-3	551	SKH	Skeen Hall.....	C-1
260		Monagle Residence Hall	F-1	579		Baseball Press Box.....	G-3
261	SHC	Student Health Center.....	E-2	585		Wooton Hall	C-2
262	FC	Food Court	E-2	588		Equine Education Center	C-3
263	PSL	PSL, Anderson Hall	D-3	590	HSS	Health & Social Services	E-1
267	FD	Fire Station	F-4	248		Univ. Comm & Marketing Serv.....	E-2
268		Chi Omega Sorority.....	G-1	596		Stan Fulton Athletic Center	H-4
269		Central Heating Plant	D-2	601	TNC	Tennis Center	H-4
270		Cole Village.....	D-4	604		Piñon Residence Hall.....	G-1
271		Greek Complex	G-4	605		Chamisa Village Apartments	G-2
275	GH	Garcia Hall Residence Center	G-1	612		Football Team Building.....	H-3
276	WH	Walden Hall	D-2				

CAMPUS OFFICE INDEX

(Building numbers are state identification numbers)

BUILDING NAME	#	GRID	BUILDING NAME	#	GRID
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Accounting & Information Systems Dept	386	E-1	*Curriculum & Instruction Dept.....	248	E-2
Accounting & Financial Reporting	172	D-1	Development Office	56	E-1
Admissions Office	338	G-2	Dining Services	285	F-2
Aerospace Studies Dept.....	32	E-2	Doña Ana Community College	341	C-3
Ag. & Extension Education Dept.....	244	C-2	DACC Trades Program	357	C-4
Ag. & Home Economics, College of	244	C-2	Econ. & International Business Dept.....	386	E-1
Ag. Economics & Ag. Business Dept	244	C-2	Economic Development, Vice Pres. for	386	E-1
Agricultural Experiment Station	244	C-2	*Educ. Mgmt. & Development Dept	248	E-2
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Alumni Relations	44	B-1	*Educational Research and Budget	278	D-3
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Americans w/ Disabilities Act Coord.....	179	D-1	Electron Microscopy Lab.....	551	C-1
Animal & Range Sciences Dept.....	368	C-2	Employee Health Center	394	F-5
Animal Care Facility	347	E-4	Engineering, College of	10	D-2
Army ROTC	32	E-2	Engineering Research Center.....	363	D-2
Art Dept	60	E-1	Engineering Technology Dept.....	541	D-2
Art Gallery	60	E-1	English Dept	364	E-1
Art Store.....	60a	E-1	Ent., Plant Path. & Weed Science Dept	551	C-1
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Arts & Sciences Research Center	184	F-2	Executive Vice President and Provost.....	172	D-1
Assistant to the President	172	D-1	Extended Learning, College of.....	83	E-2
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Audit Services	172	D-1	Financial Aid Office.....	338	G-2
Biology Dept.....	34	D-2	Fire Department, University.....	267	F-4
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Chemistry & Biochemistry Dept	187	D-1	Health Science Dept.....	590	E-1
Chicano Programs	154	F-2	History Dept.....	184	F-2
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Cooperative Education	154	F-2	Human Resources.....	172	D-1
Cooperative Extension Service.....	551	C-1	Indian Resource Development Program	244	C-2
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*College of Education offices are shown in their temporary locations (2006-2008) while O'Donnell Hall is renovated.

CAMPUS OFFICE INDEX

(Building numbers are state identification numbers)

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KRWG-TV, KRWG-FM.....	83	E-2	Soil, Water & Air Testing Lab	244	C-2
Languages & Linguistics Dept.....	184	F-2	*Special Ed./Comm. Disorders Dept.....	365	E-1
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Library, Zuhl	461	E-2	Sponsored Projects	412	F-5
Mail Services	222	F-4	Statistics Center	288	E-1
Management Dept.....	386	E-1	Student Affairs, Vice President for.....	154	F-2
Marketing Dept.....	386	E-1	Student Development.....	154	F-2
Master of Business Administration	288	E-1	Student Employment Services	154	F-2
Mathematical Sciences Dept.....	391	E-2	Student Health Center	261	E-2
Mechanical Engineering Dept.....	189	D-2	Student Success, Vice President for.....	83	E-2
Media Productions	244	C-2	Student Support Services	154	F-2
Media Technology.....	83	E-2	Sugerman Space Grant Building	212	C-2
Military Science Dept.....	32	E-2	Surveying Engineering Dept.....	363	D-2
Minority Recruitment	172	D-1	SW Technology/Dev. Institute	363	D-2
Molecular Biology	187	D-1	Teaching Academy	83	E-2
Museum.....	33	E-1	Tennis Center	601	H-4
Music Dept.....	389	D-1	Theatre Arts Dept.....	249	E-2
Myrna's Children Village.....	387	E-5	Tombaugh Observatory	317	E-4
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NM Crop Improvement	244	C-2	U.S. Department of Agriculture.....	244	C-2
NM Department of Agriculture	330	C-3	University Advancement, Vice Pres. for.....	56	E-1
NM Space Grant Consortium	212	C-2	Univ. Comm & Marketing Services	248	E-2
NMSU Foundation.....	56	E-1	Veterans Affairs Office	154	F-2
Nursing, School of.....	590	E-1	Visitor Center.....	44	B-1
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*Physical Ed., Recreation & Dance Dept.....	321	F-3	Women's Studies Program.....	391	E-2
Physical Science Laboratory	263	D-3	Zuhl Collection	44	B-1
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Plant and Environment Sciences Dept.....	551	C-1			
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Post Office.....	285	F-2			
President's Office	172	D-1			
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*College of Education offices are shown in their temporary locations (2006-2008) while O'Donnell Hall is renovated.

NEW MEXICO STATE UNIVERSITY

ACADEMIC CALENDAR 2011-2012

Fall Semester 2011

August 18- December 9, 2011

Campus Housing Opens.....	August 14
<i>Faculty Report</i>	August 15
Fall Convocation.....	August 16
Instruction Begins.....	August 18
Late Registration.....	August 18
Deadline for Filing Degree Application.....	August 26
(Students meeting requirements at end of fall)	
Deadline for Registration/Course Addition.....	August 29
Labor Day Holiday.....	September 5
Last Day to Drop Course with "W".....	October 11
(Except courses carrying designated dates)	
Last Day to Withdraw from the University.....	November 11
Thanksgiving Holiday for Students.....	November 21-25
EXAM WEEK.....	December 5-9
Last Day of Classes.....	December 9
Commencement.....	December 10
Campus Housing Closes.....	December 10
<i>Final Grades Due</i>	December 13

Spring Semester

January 19- May 11, 2012

<i>Faculty Report</i>	January 12
Curriculum Study & Improvement of Instruction.....	January 12-13
Campus Housing Opens.....	January 15
Martin Luther King Holiday.....	January 16
Spring Convocation.....	January 17
Program/Registration for New Students.....	January 18
Instruction Begins.....	January 19
Late Registration.....	January 19
Deadline for Filing Degree Application.....	January 27
(Students meeting requirements at end of spring)	
Deadline for Registration/Course Addition.....	January 30
Last Day to Drop with a "W".....	March 12
(Except courses carrying designated date)	
Spring Break.....	March 19-23
Spring Holiday.....	April 6
Last Day to Withdraw from the University.....	April 20
EXAM WEEK.....	May 7-11
Last Day of Classes.....	May 11
Commencement.....	May 12
Campus Housing Closes.....	May 12
<i>Final Grade Due</i>	May 15

Summer Semester 2012

May 24- August 3, 2012

Campus Housing Opens.....	May 23
Registration for New Students.....	May 23
Faculty Report.....	May 23
Instruction Begins.....	May 24
Memorial Day Holiday.....	May 28
Deadline for Registration/Course Addition.....	August 29
Last Day to Drop Course with "W".....	June 28
Independence Day Holiday.....	July 4
Deadline for Filing Degree Application.....	July 31
Last Day to Withdraw from the University.....	July 20
Last Day of Classes.....	August 3
Campus Housing Closes.....	August 4
Final Grades Due.....	August 7

Holidays for Administrative Offices 2011-2012

Labor Day.....	September 5
Thanksgiving.....	November 24-25
Winter Holiday.....	Dec. 23, 2011-Jan 2
Martin Luther King Holiday.....	January 16
Spring Holiday.....	April 6
Memorial Day Holiday.....	May 28
Independence Day Holiday.....	July 4

